MHVRA

INFORMED DISASTER MANAGEMENT PLAN 2023-2032

DISTRICT SANGHAR

DEVELOPED BY
PDMA SINDH

THROUGH
SUPARCO

WITH THE SUPPORT OF

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CONTENTS

PREFACE

Multi-Hazard Vulnerability Risk Assessment (MHVRA) and resultant database are the foundation for evidence-based disaster management plan. Such databases are also an integral part of the implementation of disaster risk reduction and disaster risk management strategies. The MHVRA study of the Sanghar district has been conducted successfully using high-resolution satellite imagery and its products like digital elevation models, historical disaster datasets, hydro-meteorological data, pertinent socio-economic data, and various other essential datasets. The hazard, vulnerability, and risk maps at Union Council (UC) level have been prepared and compiled as atlases. Using disaster risk information obtained through MHVRA, the disaster management plan of district Sanghar is prepared and being presented to disaster management practitioners, executors, and prominent stakeholders. Before the MHVRA study, the district-level disaster and contingency plans were prepared using conventional methods and human knowledge. In contrast, the MHVRA based disaster management plans are realistic, based on modern techniques and multiple data sources, therefore, are more authentic and reliable for planning and management of disasters in the district.

The disaster management plans are based on MHVRA study carried out to understand the hazard vulnerability and risk at UC levels. The multi-criteria approach used in this disaster management plan offers comprehensive understanding of vulnerable communities at UC levels, while offering concerned authorities with viable and best practices to minimize the hazard impacts to the communities. Also, cost-benefit analysis for recommended mitigation efforts provides clear actionable insights for relevant authorities to take necessary measures.

District-wise disaster management plans will be revised after 10 years on updation of the MHVRA study. The disaster management plan of Sanghar is comprehensive and covers guidelines on the complete spectrum of disaster management and standard operating procedures to efficiently cope with disasters and emergencies in the district.

The disaster management plan is duly approved by Provincial Disaster Management Board and demands its proactive implementation in true letter and spirit. The proactive implementation of the plan will ensure reduced disaster losses and damages in the district.

ACKNOWLEDGEMENTS

Multi-Hazard Vulnerability Risk Assessment (MHVRA) based Informed Disaster Management Plan (IDMP) for Sindh Province will help to strengthen the institutional and community level capacity to plan and implement natural hazard risk preparedness, recovery, and reduction in the province through capacity building, public education, and awareness by undertaking steps to reinforce physical, environmental and economic elements, as well as psychosocial wellbeing of communities.

SUPARCO appreciates and acknowledges the efforts of the project officials and professionals' team in preparing this comprehensive IDMP. We would also like to extend special thanks to the Project Director and Project Coordinator, Sindh Resilience Project (SRP), for their valuable inputs and necessary support required during the execution of different project activities.

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- - Disclaimer - -

The Informed Disaster Management Plan (IDMP), the product of "Multi-Hazard Vulnerability Risk Assessment (MHVRA) Study" developed for Provincial Disaster Management Authority (PDMA) Sindh under Sindh Resilience Project (PDMA Component) by Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) is based on results of MHVRA 2022 study, satellite imagery, data and information obtained from concerned departments and verifiable online sources. Every effort has been made to make this plan practical and free of errors, however, PDMA Sindh or SUPARCO are not liable for any discrepancy in data obtained from various departments. The Informed Disaster Management Plan or any part of it is not to be used for legal or litigation matters and commercial use. However, the information contained in the IDMP or any part of the IDMP can be used without prior permission of PDMA Sindh with proper citation and acknowledgements.

INTRODUCTION TO DISASTER MANAGEMENT PLAN OF DISTRICT SANGHAR

INTRODUCTION

As per the declaration of National Disaster Management Act 2010, the districts are required to develop disaster management plans to effectively cope with disasters and emergencies at district level. The objective of district wise disaster management plan is to adopt a proactive approach in managing disaster risk by building capacity and strengthening institutional mechanisms. The plan is aimed to provide direction and guidelines to district governments and other stakeholders, in a paradigm shift from reactive to a proactive approach, and to layout the standard operating procedures to be followed in the complete cycle of disaster management.

Multi-Hazard Vulnerability and Risk Assessment (MHVRA) is integral for proactive risk management, hence under Sindh Resilience Project (PDMA Component), MHVRA has been conducted at the Provincial level. MHVRA is a multi-disciplinary process involving the quantification of the frequency and intensity of possible hazard(s), the assessment of the elements that can be destroyed or damaged from possible disasters, and the degree of the damage each element can sustain when affected by certain disasters of various intensities. The assessment of hazard, exposure, vulnerability and capacity leads to the risk assessment, which indicates the anticipated damages in case of a possible disaster. Disaster risk assessment is normally the first step in planning for disaster management activities. It provides an evidence-based estimation of the risk so that effective risk reduction measures can be employed appropriately and cost-effectively.

The development of MHVRA informed disaster management plan is based on diversified information sources including satellite remote sensing, Digital Elevation Model (DEM), and pertinent information collected from concerned departments. The outcomes for MHVRA study are depicted in atlas including; landuse / landcover, critical infrastructure, hazard, exposure, vulnerability, and risk maps of cyclone and storm surge, drought, earthquake, flood, heatwave, and tsunami at UC level.

The MHVRA Informed Disaster Management Plan is a significant step towards disaster resilient Sindh because the foundation of disaster management plan is laid on realistic disaster risk identification and efficient need-based disaster preparedness and response measures. UC-level multi-disaster risk identification will not only enable active and effective disaster preparedness but also help in disaster risk reduction at the grass-root level. In addition, the plan is intended to strengthen the district disaster management system and provide guidance on pre-disaster preparedness, coordinated response and recovery through implementable agenda.

VISION

Vision of MHVRA Informed Disaster Management Plan is;

- To identify underlying UC level multi-disaster risks in administrative districts of Sindh province.
- To develop realistic Disaster Management Plan for proactive disaster management.
- To ensure prioritization of disaster risk reduction measures at UC level.
- To enforce better coordination for disaster response.
- To improve rehabilitation plans for restoration of livelihood, and organizational capacities of affected communities.

OBJECTIVES

The plan is intended to meet following objectives in 10 years;

1. Building disaster resilience capacity at UC level to minimize the loss of lives, livelihood, assets and environment.

2. Improved understanding of disaster risk, hazard and vulnerabilities to strengthen disaster governance from local level to provincial level.

3. Enhanced preparedness to improve disaster response at grass-root level.

4. Promote and facilitate Disaster Risk Reduction (DRR) in planning and implementation of development projects to increase resilience.

5. Provide clarity on roles and responsibilities of various departments and stakeholders involved in different aspects of disaster management.

6. Promote "Build Back Better" principle in recovery, rehabilitation and reconstruction.

7. Promote social inclusion and communities as partners to reduce and manage disaster risk.

8. Promote disaster prevention and mitigation culture at local level.

REVIEW OF MHVRA INFORMED DISASTER MANAGEMENT PLAN

The MHVRA Informed Disaster Management Plan is planned to be effective for 10 years starting from January 2023 to December 2032 and requires review before completion of 10 years. Periodic review is essential because of following reasons;

1. During 10 years, there will be likely chances of new development in the district hence, vulnerability, exposure, and risk assessment will require updation.

1. Planning is a dynamic process, therefore, disaster management plan must be reviewed periodically to incorporate changes according to the emergence of new eminent disasters and situations.

2. Climate is a dynamic driver of changing hazard risks, therefore, it is important to review disaster management plan in changing disaster scenarios.

Additionally, it is also recommended to review the plan after the occurrence of each disaster event to measure its effectiveness. Necessary adjustment may be carried out in the plan accordingly.

Foregoing in view, it is recommended to formulate a committee to review the disaster management plan. A review of the plan shall be carried out by the concerned DDMA under the supervisory role of PDMA Sindh. Recommended composition of the plan review committee is as follows;

Table 1: Recommended Committee for Reviewing Disaster Management Plan

Committee Representative	Role
DG, PDMA Sindh / Dir Ops PDMA	Chairman
Concerned DC or representative officer	Member
Concerned officer from local government	Member
Elected representative of the concerned district	Member
Representatives from disaster affected communities	Member (s)
Representative from SUPARCO	Member
Representative from research / academia experienced in disaster management field	Member (s)
Representative from UN Organization on disaster related domains in Pakistan, especially in Sindh	Member
Representative from reputed NGO working on disaster related domains especially in Sindh	Member

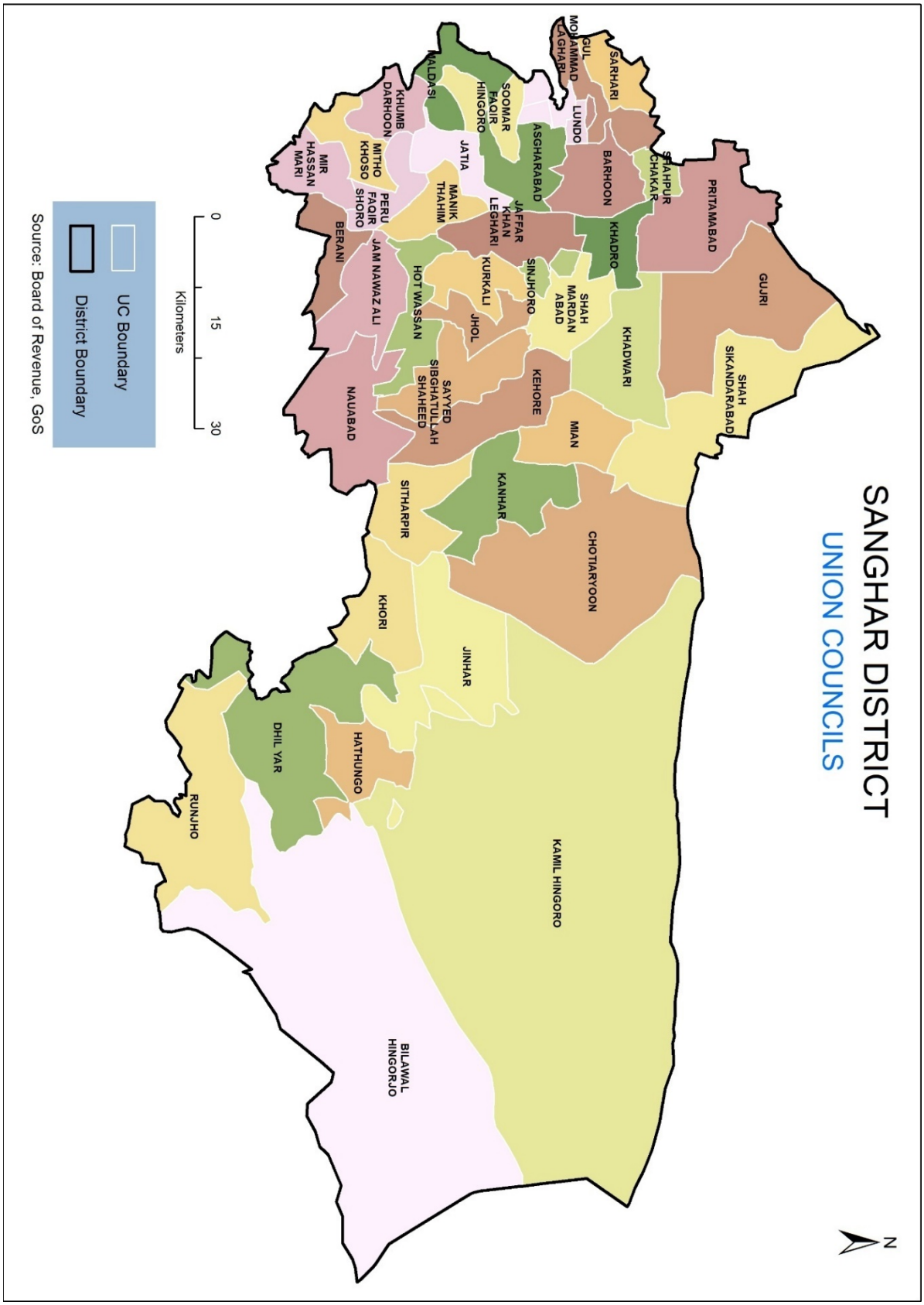
MODES OF REVIEW

Preferred modes of review of plan are;

a. For a post-disaster review of the plan, PDMA shall conduct a questionnaire-based survey covering pertinent questions to identify gaps or issues in the plan. A questionnaire-based survey can be conducted through online survey services or organizing online meetings. Once issues have been identified by the committee, necessary changes be incorporated in the plan and the revised plan be approved by review committee.
b. For review before the expiry of the validity of the plan, necessary updation in baseline mapping i.e., hazard, exposure, vulnerability, and risk assessment be carried out to incorporate new developments and disaster situations. Once, baseline mapping is updated, plan is to be updated accordingly. The review committee shall vet the updation of the plan in the light of experience and recommendations. Upon approval from the review committee, the plan shall be effective for next 10-years.

DISASTER RISK PROFILE OF DISTRICT SANGHAR

DISTRICT SANGHAR AT A GLANCE



GEOGRAPHY

District area in Sq. Km	9,773	
Coordinates	Longitude 68° 26' 23" to 70° 13' 45" East Latitude 25° 29' 1" to 26° 27' 33"North	
Surrounding Districts	Khairpur in North Matiari and Shaheed Benazirabad in West Tando Allahyar in South West Mirpurkhas in South Umerkot in South East India in East	
Climate Conditions	Hot and Semi-Arid	
Coldest Month Hottest Month	January May	
Seasonal Temperatures	Max Mean (°C)	Min Mean (°C)
Spring (March and April)	38.35	20.99
Dry Summer (May and June)	43.90	28.02
Wet Summer (July to September)	39.89	27.43
Autumn (October to November)	35.55	19.72
Winter (December to February)	27.58	11.54
Average Rainfall	158.14 mm/year	
Physiographic Features	Chotiari Lake, Botar Lake, Baandho Lake	

DEMOGRAPHY

	Year-1998	**Year-2017**
Population	1,319,881	2,049,873
Urban	331,316	571,719
Rural	988,565	1,478,154
No. of Household	-	374,609
Average Annual Growth Rate 1998-2017	2.34 %	

ECONOMY

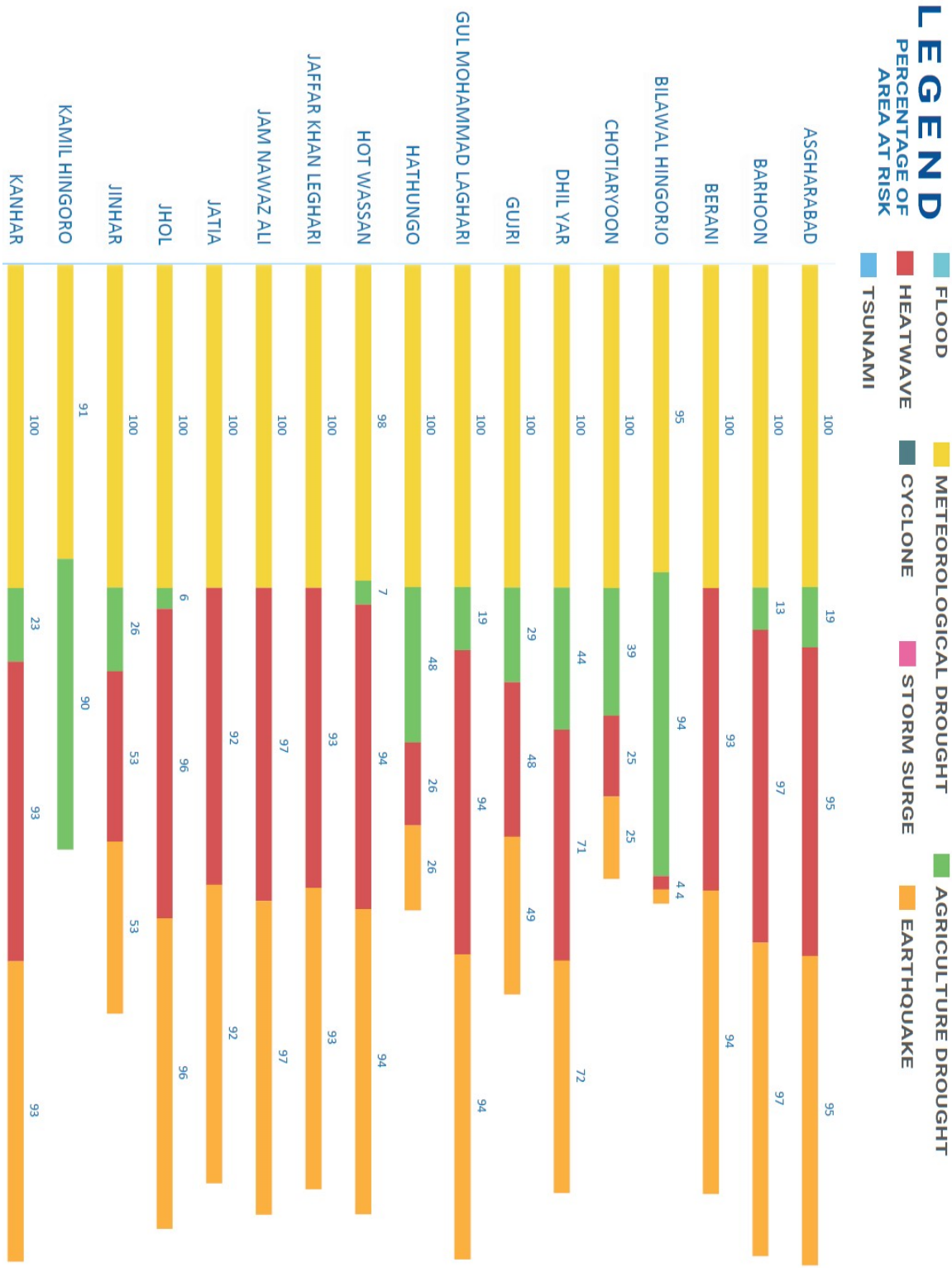
Industries	Manufacture of Textiles, Food Products and Beverages
Agriculture	Production in M.tons as per (2016-17)
Major Crops	
Sugarcane	1,012,185
Cotton	116,864
Wheat	158,242
Minor Crops	
Bajra	214
Jowar	562

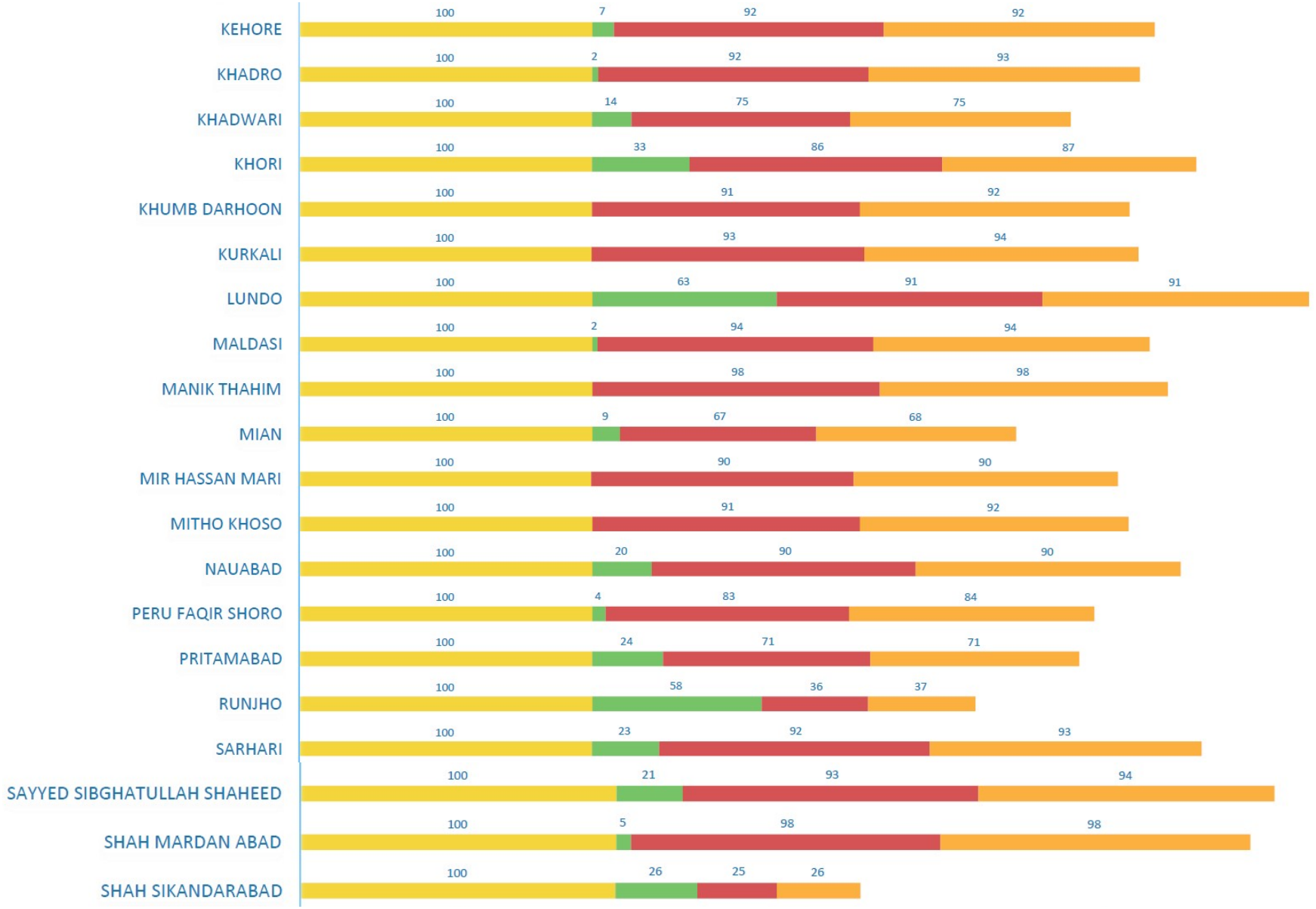
Rapeseed And Mustard	8,242
Maize	198
Sesame	49

ADMINISTRATIVE SYSTEM

TALUKA NAMES	UC NAMES
1. Jam Nawaz Ali Taluka 2. Khipro Taluka 3. Sanghar Taluka 4. Shahdadpur Taluka 5. Sinjhoro Taluka 6. Tando Adam Taluka	1. Asgharabad 2. Barhoon 3. Berani 4. Bilawal Hingorjo 5. Chotiaryoon 6. Dhil Yar 7. Gujri 8. Gul Mohammad Laghari 9. Hathungo 10. Hot Wassan 11. Jaffar Khan Leghari 12. Jam Nawaz Ali 13. Jatia 14. Jhol 15. Jinhar 16. Kamil Hingoro 17. Kanhar 18. Kehore 19. Khadro 20. Khadwari 21. Khori 22. Khumb Darhoon 23. Kurkali 24. Lundo 25. Maldasi 26. Manik Thahim 27. Mian 28. Mir Hassan Mari 29. Mitho Khoso 30. Nauabad 31. Peru Faqir Shoro 32. Pritamabad 33. Runjho 34. Sarhari 35. Sayyed Sibghatullah Shaheed 36. Shah Mardan Abad 37. Shah Sikandarabad 38. Shahpur Chakar 39. Sinjhoro 40. Sitharpir 41. Soomar Faqir Hingoro

SANGHAR DISTRICT MULTI-HAZARD RISK PROFILES

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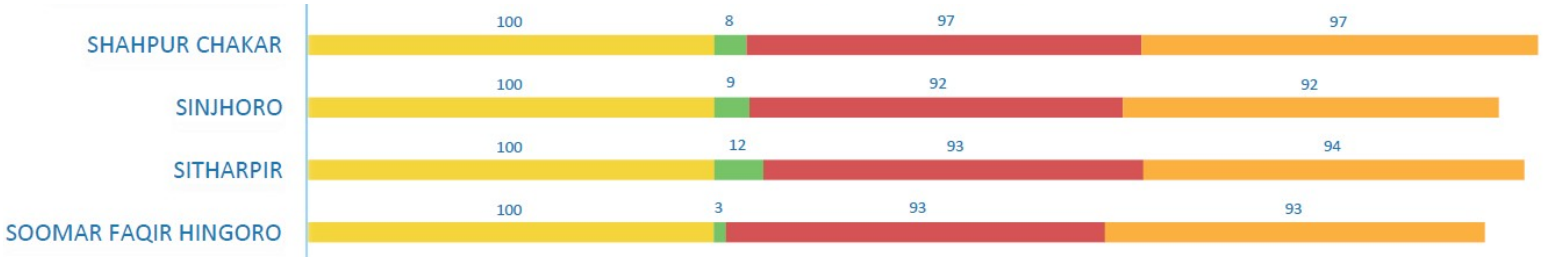
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UC WISE RISK PROFILE

Asgharabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	102.425 sq km
		Forest Area	0.005 sq km
		Natural Vegetation in Wet Areas	0.007 sq km
		Pakka Planned Area	0.021 sq km
		Pakka Unplanned Area	2.396 sq km
		Range Land	0.142 sq km
		Education Facilities	54
		Petrol Pumps	2
		Settlements	86
		Irrigation and Drainage Network	42.795 km
		Railway Line	2.52 km
		Road Network	224.324 km
		Population	31002
		Household	5689
Meteorological Drought	Medium - Extreme	Agriculture Area	102.544 sq km
		Forest Area	0.187 sq km
		Natural Vegetation in Wet Areas	0.266 sq km
		Range Land	2.077 sq km
		Water Body	0.038 sq km
		Wet Area	1.456 sq km
		Settlements	86
		Population	31404
		Household	5761
Heatwave	Low - High	Agriculture Area	102.375 sq km
		Pakka Planned Area	0.02 sq km
		Pakka Unplanned Area	2.405 sq km
		Population	31116
		Household	5710
		Settlements	84
Agricultural Drought	Low – Medium	Agriculture Area	22.407 sq km
		Forest Area	0.175 sq km
		Range Land	2.443 sq km
		Water Body	0.029 sq km
		Settlements	7
		Population	2879

		Household	527
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Barhoon			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	113.03 sq km
		Forest Area	0.008 sq km
		Natural Vegetation in Wet Areas	0.013 sq km
		Pakka Planned Area	0.149 sq km
		Pakka Unplanned Area	3.24 sq km
		Range Land	0.094 sq km
		Education Facilities	94
		Health Facilities	2
		Petrol Pumps	2
		Settlements	120
		Irrigation and Drainage Network	55.158 km
		Road Network	277.33 km
		Population	45319
		Household	8351
Meteorological Drought	Medium - Extreme	Agriculture Area	113.195 sq km
		Forest Area	0.046 sq km
		Natural Vegetation in Wet Areas	0.306 sq km
		Range Land	1.041 sq km
		Water Body	0.157 sq km
		Wet Area	1.13 sq km
		Settlements	120
		Population	45883
		Household	8451
Heatwave	Low - High	Agriculture Area	112.966 sq km
		Pakka Planned Area	0.148 sq km
		Pakka Unplanned Area	3.246 sq km
		Population	45382

		Household	8368
		Settlements	119
Agricultural Drought	Low - Medium	Agriculture Area	18.168 sq km
		Forest Area	0.026 sq km
		Range Land	0.778 sq km
		Water Body	0.03 sq km
		Wet Area	0.298 sq km
		Settlements	7
		Population	2444
		Household	448
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Berani			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	74.013 sq km
		Forest Area	0.005 sq km
		Kachcha Area	0.089 sq km
		Natural Vegetation in Wet Areas	0.002 sq km
		Pakka Unplanned Area	1.756 sq km
		Range Land	0.05 sq km
		Bridges	2
		Education Facilities	36
		Health Facilities	1
		Mobile Towers	2
		Petrol Pumps	2
		Settlements	74
		Irrigation and Drainage Network	30.785 km
		Road Network	165.176 km
		Population	19063
		Household	3474
Meteorological Drought	Medium - Extreme	Agriculture Area	74.134 sq km
		Forest Area	0.137 sq km
		Natural Vegetation in Wet Areas	0.056 sq km

		Range Land	0.994 sq km
		Water Body	2.778 sq km
		Wet Area	0.82 sq km
		Settlements	74
		Population	19269
		Household	3508
Heatwave	Low - High	Agriculture Area	73.976 sq km
		Kachcha Area	0.089 sq km
		Pakka Unplanned Area	1.76 sq km
		Population	19107
		Household	3481
		Settlements	72
Agricultural Drought	Low	Agriculture Area	0.088 sq km
		Range Land	0.159 sq km
		Population	1
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Bilawal Hingorjo			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	55.162 sq km
		Kachcha Area	0.366 sq km
		Natural Vegetation in Wet Areas	0.001 sq km
		Pakka Unplanned Area	0.706 sq km
		Range Land	0.006 sq km
		Education Facilities	37
		Settlements	56
		Road Network	82.564 km
		Population	7934
		Household	1545
Meteorological Drought	Medium - Extreme	Agriculture Area	57.103 sq km
		Bare Area with sparse Natural Vegetation	1264.269 sq km
		Natural Vegetation in Wet Areas	0.786 sq km

		Range Land	0.478 sq km
		Water Body	2.811 sq km
		Settlements	40
		Population	8059
		Household	1569
Heatwave	Low - High	Agriculture Area	54.717 sq km
		Kachcha Area	0.368 sq km
		Pakka Unplanned Area	0.708 sq km
		Population	7960
		Household	1550
		Settlements	11
Agricultural Drought	Low - Extreme	Agriculture Area	63.427 sq km
		Bare Area with sparse Natural Vegetation	1542.678 sq km
		Natural Vegetation in Wet Areas	0.594 sq km
		Range Land	0.586 sq km
		Water Body	2.335 sq km
		Settlements	36
		Population	6998
		Household	1363
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Chotiaryoon			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	132.45 sq km
		Forest Area	0.031 sq km
		Kachcha Area	3.293 sq km
		Natural Vegetation in Wet Areas	0.475 sq km
		Pakka Unplanned Area	1.473 sq km
		Range Land	0.155 sq km
		Bridges	6
		Education Facilities	55
		Health Facilities	2
		Mobile Towers	7

		Petrol Pumps	3
		Settlements	88
		Tourist Places	1
		Irrigation and Drainage Network	70.98 km
		Road Network	268.627 km
		Population	77654
		Household	14217
Meteorological Drought	Medium - Extreme	Agriculture Area	133.13 sq km
		Bare Area with sparse Natural Vegetation	286.653 sq km
		Forest Area	0.845 sq km
		Natural Vegetation in Wet Areas	22.054 sq km
		Range Land	4.085 sq km
		Water Body	81.497 sq km
		Wet Area	17.879 sq km
		Settlements	88
		Population	78617
		Household	14390
Heatwave	Low - High	Agriculture Area	132.187 sq km
		Kachcha Area	3.305 sq km
		Pakka Unplanned Area	1.478 sq km
		Population	77915
		Household	14263
		Settlements	73
Agricultural Drought	Low - Extreme	Agriculture Area	13.19 sq km
		Bare Area with sparse Natural Vegetation	220.813 sq km
		Natural Vegetation in Wet Areas	4.822 sq km
		Range Land	1.402 sq km
		Water Body	22.526 sq km
		Wet Area	6.543 sq km
		Settlements	2
		Population	318
		Household	57
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	

Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone

Dhil Yar			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	256.433 sq km
		Forest Area	0.055 sq km
		Kachcha Area	3.218 sq km
		Natural Vegetation in Wet Areas	0.18 sq km
		Pakka Planned Area	0.44 sq km
		Pakka Unplanned Area	9.515 sq km
		Range Land	0.165 sq km
		Bridges	3
		Bus Stops	3
		Education Facilities	222
		Grain Mandi	1
		Health Facilities	11
		Industry	1
		Mobile Towers	5
		Petrol Pumps	2
		Police Stations	1
		Settlements	318
		Tourist Places	1
		Irrigation and Drainage Network	73.63 km
		Road Network	510.687 km
		Population	136549
		Household	25671
Meteorological Drought	Medium - Extreme	Agriculture Area	256.982 sq km
		Bare Area with sparse Natural Vegetation	81.315 sq km
		Forest Area	0.78 sq km
		Natural Vegetation in Wet Areas	2.7 sq km
		Range Land	2.501 sq km
		Water Body	4.666 sq km
		Wet Area	9.499 sq km
		Settlements	318
		Population	137709
		Household	25887
Heatwave	Low - High	Agriculture Area	256.233 sq km
		Kachcha Area	3.222 sq km
		Pakka Planned Area	0.44 sq km
		Pakka Unplanned Area	9.532 sq km

		Population	136746
		Household	25714
		Settlements	306
Agricultural Drought	Low - High	Agriculture Area	100.538 sq km
		Bare Area with sparse Natural Vegetation	82.675 sq km
		Forest Area	0.65 sq km
		Natural Vegetation in Wet Areas	1.316 sq km
		Range Land	2.821 sq km
		Water Body	5.692 sq km
		Wet Area	7.432 sq km
		Settlements	80
		Population	14527
		Household	2829
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Gujri			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	151.668 sq km
		Forest Area	0.013 sq km
		Kachcha Area	0.028 sq km
		Natural Vegetation in Wet Areas	1.189 sq km
		Pakka Planned Area	0.085 sq km
		Pakka Unplanned Area	0.501 sq km
		Range Land	0.434 sq km
		Bridges	10
		Education Facilities	51
		Petrol Pumps	2
		Settlements	46
		Irrigation and Drainage Network	113.24 km
		Road Network	312.062 km
		Population	8963
		Household	1612
Meteorological	Medium - Extreme	Agriculture Area	153.997 sq km

Drought		Bare Area with sparse Natural Vegetation	104.951 sq km
		Forest Area	0.219 sq km
		Natural Vegetation in Wet Areas	28.089 sq km
		Range Land	12.373 sq km
		Water Body	6.981 sq km
		Wet Area	15.849 sq km
		Settlements	46
		Population	9086
		Household	1634
Heatwave	Low – Medium	Agriculture Area	150.941 sq km
		Kachcha Area	0.027 sq km
		Pakka Planned Area	0.086 sq km
		Pakka Unplanned Area	0.5 sq km
		Population	8950
		Household	1609
		Settlements	34
Agricultural Drought	Low - Medium	Agriculture Area	27.8 sq km
		Bare Area with sparse Natural Vegetation	40.564 sq km
		Forest Area	0.263 sq km
		Natural Vegetation in Wet Areas	22.556 sq km
		Range Land	13.724 sq km
		Water Body	7.218 sq km
		Wet Area	5.049 sq km
		Settlements	7
		Population	966
		Household	172
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Gul Mohammad Laghari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	80.196 sq km
		Forest Area	0.056 sq km
		Natural Vegetation in Wet	0.001 sq km

		Areas	
		Pakka Planned Area	0.051 sq km
		Pakka Unplanned Area	2.75 sq km
		Range Land	0.044 sq km
		Education Facilities	76
		Health Facilities	1
		Mobile Towers	1
		Settlements	93
		Irrigation and Drainage Network	26.425 km
		Railway Line	4.229 km
		Road Network	186.765 km
		Population	35586
		Household	6526
Meteorological Drought	Medium - Extreme	Agriculture Area	80.378 sq km
		Forest Area	0.658 sq km
		Natural Vegetation in Wet Areas	0.069 sq km
		Range Land	1.186 sq km
		Wet Area	0.999 sq km
		Settlements	93
		Population	36041
		Household	6606
Heatwave	Low – Medium	Agriculture Area	80.14 sq km
		Pakka Planned Area	0.052 sq km
		Pakka Unplanned Area	2.761 sq km
		Population	35722
		Household	6549
		Settlements	92
Agricultural Drought	Low - Medium	Agriculture Area	17.847 sq km
		Forest Area	0.778 sq km
		Range Land	1.453 sq km
		Wet Area	0.667 sq km
		Settlements	9
		Population	7799
		Household	1429
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone

Hathungo			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	27.064 sq km
		Forest Area	0.002 sq km
		Kachcha Area	0.409 sq km
		Pakka Unplanned Area	2.963 sq km
		Range Land	0.074 sq km
		Education Facilities	61
		Health Facilities	1
		Settlements	45
		Irrigation and Drainage Network	9.536 km
		Road Network	103.065 km
		Population	24949
		Household	4856
Meteorological Drought	Medium - Extreme	Agriculture Area	27.126 sq km
		Bare Area with sparse Natural Vegetation	78.082 sq km
		Forest Area	0.05 sq km
		Range Land	1.164 sq km
		Water Body	8.106 sq km
		Wet Area	0.562 sq km
		Settlements	45
		Population	25242
		Household	4912
Heatwave	Low – High	Agriculture Area	27.034 sq km
		Kachcha Area	0.409 sq km
		Pakka Unplanned Area	2.963 sq km
		Population	24952
		Household	4856
		Settlements	40
Agricultural Drought	Low - Medium	Agriculture Area	0.07 sq km
		Bare Area with sparse Natural Vegetation	59.149 sq km
		Forest Area	0.024 sq km
		Range Land	0.955 sq km
		Water Body	9.671 sq km
		Wet Area	0.594 sq km

		Settlements	1
		Population	272
		Household	53
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Hot Wassan			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	93.58 sq km
		Forest Area	0.01 sq km
		Kachcha Area	0.071 sq km
		Natural Vegetation in Wet Areas	0.003 sq km
		Pakka Planned Area	0.231 sq km
		Pakka Unplanned Area	2.283 sq km
		Range Land	0.132 sq km
		Bridges	3
		Education Facilities	56
		Health Facilities	1
		Petrol Pumps	1
		Settlements	91
		Irrigation and Drainage Network	37.31 km
		Road Network	179.891 km
		Population	24681
		Household	4495
Meteorological Drought	Medium - Extreme	Agriculture Area	93.719 sq km
		Forest Area	0.254 sq km
		Natural Vegetation in Wet Areas	0.068 sq km
		Range Land	1.633 sq km
		Water Body	0.87 sq km
		Wet Area	0.409 sq km
		Settlements	91
		Population	24983
		Household	4547
Heatwave	Low - High	Agriculture Area	93.525 sq km

		Kachcha Area	0.072 sq km
		Pakka Planned Area	0.231 sq km
		Pakka Unplanned Area	2.288 sq km
		Population	24734
		Household	4504
		Settlements	91
Agricultural Drought	Low	Agriculture Area	9.099 sq km
		Forest Area	0.01 sq km
		Range Land	0.161 sq km
		Settlements	1
		Population	18
		Household	2
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Jaffar Khan Leghari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	102.212 sq km
		Forest Area	0.031 sq km
		Natural Vegetation in Wet Areas	0.127 sq km
		Pakka Planned Area	0.086 sq km
		Pakka Unplanned Area	2.908 sq km
		Range Land	0.031 sq km
		Bridges	6
		Education Facilities	84
		Health Facilities	1
		Industry	1
		Mobile Towers	1
		Petrol Pumps	1
		Settlements	124
		Irrigation and Drainage Network	95.812 km
		Road Network	319.745 km
		Population	45299
		Household	8186
Meteorological	Medium - Extreme	Agriculture Area	102.425 sq km

Drought		Forest Area	0.171 sq km
		Natural Vegetation in Wet Areas	1.141 sq km
		Range Land	0.85 sq km
		Water Body	2.339 sq km
		Wet Area	2.624 sq km
		Settlements	124
		Population	45983
		Household	8303
Heatwave	Low - High	Agriculture	102.103 sq km
		Pakka Planned	0.086 sq km
		Pakka Unplanned	2.917 sq km
		Population	45440
		Household	8207
		Settlements	122
Agricultural Drought	Low	Agriculture	0.524 sq km
		Wet Area	0.002 sq km
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Jam Nawaz Ali			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	129.034 sq km
		Forest Area	0.004 sq km
		Kachcha Area	0.328 sq km
		Natural Vegetation in Wet Areas	0.007 sq km
		Pakka Planned Area	1.258 sq km
		Pakka Unplanned Area	3.602 sq km
		Range Land	0.03 sq km
		Bridges	3
		Education Facilities	67
		Health Facilities	4
		Mobile Towers	6
		Petrol Pumps	6
		Post Offices	1
		Settlements	138

		Irrigation and Drainage Network	54.381 km
		Road Network	259.828 km
		Population	74602
		Household	13717
Meteorological Drought	Medium - Extreme	Agriculture Area	129.186 sq km
		Forest Area	0.148 sq km
		Natural Vegetation in Wet Areas	0.163 sq km
		Range Land	0.238 sq km
		Wet Area	2.044 sq km
		Settlements	138
		Population	75208
		Household	13824
Heatwave	Low - High	Agriculture Area	128.964 sq km
		Kachcha Area	0.328 sq km
		Pakka Planned Area	1.259 sq km
		Pakka Unplanned Area	3.606 sq km
		Population	74654
		Household	13727
		Settlements	133
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agriculture Drought	Nil	The UC falls out of vulnerable zone for Agriculture Drought	

Jatia			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Grain Mandi	1
		Agriculture Area	95.213 sq km
		Forest Area	0.031 sq km
		Kachcha Area	0.031 sq km
		Natural Vegetation in Wet Areas	0.013 sq km
		Pakka Planned Area	1.765 sq km
		Pakka Unplanned Area	8.497 sq km

		Range Land	0.035 sq km
		Ambulance Services	1
		Bridges	1
		Bus Stops	4
		Education Facilities	143
		Fire Stations	1
		Grid Stations	1
		Health Facilities	10
		Industry	4
		Mobile Towers	9
		Petrol Pumps	15
		Police Stations	2
		Post Offices	3
		Settlements	111
		Tourist Places	1
		Irrigation and Drainage Network	33.747 km
		Railway Line	15.211 km
		Road Network	241.125 km
		Population	192692
		Household	33790
Meteorological Drought	Medium - Extreme	Agriculture Area	95.444 sq km
		Bare Area with sparse Natural Vegetation	0.294 sq km
		Forest Area	0.218 sq km
		Natural Vegetation in Wet Areas	0.23 sq km
		Range Land	0.195 sq km
		Water Body	3.085 sq km
		Wet Area	1.59 sq km
		Settlements	111
		Population	193947
		Household	34012
Heatwave	Low - High	Agriculture Area	95.126 sq km
		Kachcha Area	0.031 sq km
		Pakka Planned Area	1.766 sq km
		Pakka Unplanned Area	8.51 sq km
		Population	192877
		Household	33822
		Settlements	109
Agricultural Drought	Low	Agriculture Area	0.635 sq km
		Forest Area	0.055 sq km
		Range Land	0.235 sq km

		Water Body	0.074 sq km
		Population	223
		Household	42
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Jhol			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	62.982 sq km
		Kachcha Area	0.161 sq km
		Pakka Planned Area	0.092 sq km
		Pakka Unplanned Area	2.045 sq km
		Range Land	0.012 sq km
		Bridges	5
		Education Facilities	62
		Health Facilities	2
		Mobile Towers	6
		Petrol Pumps	5
		Police Stations	1
		Settlements	69
		Irrigation and Drainage Network	28.666 km
		Road Network	143.484 km
		Population	42929
		Household	7795
Meteorological Drought	Medium - Extreme	Agriculture Area	63.063 sq km
		Range Land	0.238 sq km
		Water Body	0.096 sq km
		Wet Area	1.732 sq km
		Settlements	69
		Population	43403
		Household	7877
Heatwave	Low - High	Agriculture Area	62.94 sq km
		Kachcha Area	0.162 sq km
		Pakka Planned Area	0.091 sq km
		Pakka Unplanned Area	2.047 sq km

		Population	42987
		Household	7801
		Settlements	68
Agricultural Drought	Low	Agriculture Area	5.403 sq km
		Wet Area	0.01 sq km
		Population	31
		Household	4
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Jinhar			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	149.306 sq km
		Forest Area	0.209 sq km
		Kachcha Area	8.557 sq km
		Natural Vegetation in Wet Areas	0.492 sq km
		Pakka Unplanned Area	1.263 sq km
		Range Land	0.204 sq km
		Bridges	1
		Education Facilities	104
		Health Facilities	5
		Settlements	156
		Irrigation and Drainage Network	35.827 km
		Road Network	344.117 km
		Population	73029
		Household	14203
Meteorological Drought	Medium - Extreme	Agriculture Area	150.001 sq km
		Bare Area with sparse Natural Vegetation	113.31 sq km
		Forest Area	5.142 sq km
		Natural Vegetation in Wet Areas	4.924 sq km
		Range Land	6.92 sq km
		Water Body	10.034 sq km
		Wet Area	2.397 sq km
		Settlements	155

		Population	73975
		Household	14386
Heatwave	Low - High	Agriculture Area	149.028 sq km
		Kachcha Area	8.582 sq km
		Pakka Unplanned Area	1.266 sq km
		Population	73244
		Household	14241
		Settlements	141
Agricultural Drought	Medium- Extreme	Agriculture Area	7.418 sq km
		Bare Area with sparse Natural Vegetation	78.905 sq km
		Forest Area	0.64 sq km
		Natural Vegetation in Wet Areas	0.607 sq km
		Range Land	4.303 sq km
		Water Body	4.813 sq km
		Wet Area	0.021 sq km
		Settlements	5
		Population	4089
		Household	794
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Kamil Hingoro			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	9.335 sq km
		Kachcha Area	0.619 sq km
		Natural Vegetation in Wet Areas	0.017 sq km
		Range Land	0.009 sq km
		Education Facilities	31
		Settlements	52
		Road Network	103.599 km
		Population	4578
		Household	891
Meteorological	Medium - Extreme	Agriculture Area	9.576 sq km

Drought		Bare Area with sparse Natural Vegetation	2273.983 sq km
		Natural Vegetation in Wet Areas	1.184 sq km
		Range Land	0.453 sq km
		Water Body	2.277 sq km
		Wet Area	1.1 sq km
		Settlements	40
		Population	4664
		Household	908
Heatwave	Low - Medium	Agriculture Area	9.256 sq km
		Kachcha Area	0.62 sq km
		Population	4590
		Household	893
		Settlements	4
Agricultural Drought	Low - Extreme	Agriculture Area	7.82 sq km
		Bare Area with sparse Natural Vegetation	2782.685 sq km
		Natural Vegetation in Wet Areas	1.269 sq km
		Range Land	0.557 sq km
		Water Body	2.724 sq km
		Wet Area	1.358 sq km
		Settlements	38
		Population	5374
		Household	1045
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Kanhar			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	174.967 sq km
		Kachcha Area	0.595 sq km
		Natural Vegetation in Wet Areas	0.072 sq km
		Pakka Unplanned Area	1.665 sq km
		Range Land	0.024 sq km
		Bridges	3

		Education Facilities	64
		Health Facilities	1
		Settlements	105
		Irrigation and Drainage Network	64.028 km
		Road Network	257.403 km
		Population	38358
		Household	6902
Meteorological Drought	Medium - Extreme	Agriculture Area	175.22 sq km
		Bare Area with sparse Natural Vegetation	1.745 sq km
		Natural Vegetation in Wet Areas	1.984 sq km
		Range Land	0.275 sq km
		Water Body	0.091 sq km
		Wet Area	9.717 sq km
		Settlements	105
		Population	38955
		Household	7009
Heatwave	Low - High	Agriculture Area	174.852 sq km
		Kachcha Area	0.597 sq km
		Pakka Unplanned Area	1.674 sq km
		Population	38543
		Household	6943
		Settlements	104
Agricultural Drought	Low - High	Agriculture Area	45.22 sq km
		Bare Area with sparse Natural Vegetation	0.726 sq km
		Natural Vegetation in Wet Areas	2.323 sq km
		Wet Area	5.494 sq km
		Settlements	1
		Population	40
		Household	6
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Kehore			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	153.715 sq km
		Kachcha Area	0.094 sq km
		Natural Vegetation in Wet Areas	0.007 sq km
		Pakka Planned Area	4.715 sq km
		Pakka Unplanned Area	5.264 sq km
		Range Land	0.055 sq km
		Bridges	8
		Bus Stops	10
		Education Facilities	98
		Grain Mandi	1
		Health Facilities	9
		Industry	13
		Mobile Towers	20
		Petrol Pumps	13
		Police Stations	1
		Post Offices	3
		Power Plants	1
		Settlements	140
		Irrigation and Drainage Network	86.558 km
		Road Network	306.846 km
		Population	127387
		Household	23264
Meteorological Drought	Medium - Extreme	Agriculture Area	154.008 sq km
		Natural Vegetation in Wet Areas	0.341 sq km
		Range Land	1.131 sq km
		Water Body	0.278 sq km
		Wet Area	6.774 sq km
		Settlements	140
		Population	128263
		Household	23418
Heatwave	Low - High	Agriculture Area	153.568 sq km
		Kachcha Area	0.094 sq km
		Pakka Planned Area	4.715 sq km
		Pakka Unplanned Area	5.269 sq km
		Population	127481
		Household	23279
		Settlements	137
Agricultural Drought	Low - Medium	Agriculture Area	13.386 sq km

		Range Land	0.164 sq km
		Water Body	0.144 sq km
		Wet Area	2.305 sq km
		Settlements	5
		Population	586
		Household	105
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Khadro			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	71.085 sq km
		Forest Area	0.002 sq km
		Kachcha Area	0.061 sq km
		Pakka Planned Area	0.059 sq km
		Pakka Unplanned Area	2.481 sq km
		Range Land	0.07 sq km
		Bridges	5
		Education Facilities	62
		Health Facilities	4
		Industry	1
		Mobile Towers	5
		Petrol Pumps	3
		Police Stations	1
		Post Offices	1
		Settlements	69
		Irrigation and Drainage Network	49.726 km
		Road Network	235.467 km
		Population	45341
		Household	8094
Meteorological Drought	Medium - Extreme	Agriculture Area	71.283 sq km
		Bare Area with sparse Natural Vegetation	3.22 sq km
		Forest Area	0.048 sq km
		Range Land	0.69 sq km
		Water Body	0.085 sq km

		Wet Area	0.791 sq km
		Settlements	69
		Population	45830
		Household	8183
Heatwave	Low - High	Agriculture Area	71.027 sq km
		Kachcha Area	0.061 sq km
		Pakka Planned Area	0.059 sq km
		Pakka Unplanned Area	2.483 sq km
		Population	45389
		Household	8107
		Settlements	67
Agricultural Drought	Low	Agriculture Area	2.112 sq km
		Bare Area with sparse Natural Vegetation	0.002 sq km
		Population	4
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Khadwari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	139.465 sq km
		Forest Area	0.017 sq km
		Kachcha Area	0.194 sq km
		Natural Vegetation in Wet Areas	0.298 sq km
		Pakka Planned Area	0.294 sq km
		Pakka Unplanned Area	2.302 sq km
		Range Land	0.158 sq km
		Bridges	6
		Bus Stops	1
		Education Facilities	67
		Health Facilities	1
		Mobile Towers	1
		Petrol Pumps	4
		Police Stations	1
		Settlements	68
		Irrigation and Drainage	84.451 km

		Network	
		Road Network	343.363 km
		Population	47218
		Household	8503
Heatwave	Low - High	Agriculture Area	139.227 sq km
		Kachcha Area	0.194 sq km
		Pakka Planned Area	0.295 sq km
		Pakka Unplanned Area	2.305 sq km
		Population	47293
		Household	8519
		Settlements	67
Meteorological Drought	Medium - Extreme	Agriculture Area	140.069 sq km
		Bare Area with sparse Natural Vegetation	20.527 sq km
		Forest Area	0.331 sq km
		Natural Vegetation in Wet Areas	19.026 sq km
		Range Land	2.498 sq km
		Water Body	1.121 sq km
		Wet Area	3.182 sq km
		Settlements	68
		Population	47714
		Household	8592
Agricultural Drought	Low - Medium	Agriculture Area	21.903 sq km
		Bare Area with sparse Natural Vegetation	2.657 sq km
		Forest Area	0.399 sq km
		Natural Vegetation in Wet Areas	3.149 sq km
		Range Land	3.03 sq km
		Water Body	0.784 sq km
		Wet Area	0.155 sq km
		Settlements	2
		Population	50
		Household	9
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Khori			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	122.651 sq km
		Forest Area	0.025 sq km
		Kachcha Area	2.614 sq km
		Natural Vegetation in Wet Areas	0.315 sq km
		Pakka Unplanned Area	1.008 sq km
		Range Land	0.012 sq km
		Bus Stops	1
		Education Facilities	55
		Health Facilities	1
		Mobile Towers	2
		Petrol Pumps	2
		Settlements	104
		Irrigation and Drainage Network	33.611 km
		Road Network	248.965 km
		Population	26802
		Household	5218
Heatwave	Low - High	Agriculture Area	122.512 sq km
		Kachcha Area	2.626 sq km
		Pakka Unplanned Area	1.012 sq km
		Population	26915
		Household	5242
		Settlements	103
Meteorological Drought	Medium - Extreme	Agriculture Area	122.983 sq km
		Bare Area with sparse Natural Vegetation	0.042 sq km
		Forest Area	0.339 sq km
		Natural Vegetation in Wet Areas	3.048 sq km
		Range Land	0.287 sq km
		Water Body	0.019 sq km
		Wet Area	15.455 sq km
		Settlements	104
		Population	27116
		Household	5277
Agricultural Drought	Low - Extreme	Agriculture Area	42.572 sq km
		Range Land	0.233 sq km
		Wet Area	16.491 sq km
		Settlements	17

		Population	2564
		Household	496
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Khumb Darhoon			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	69.797 sq km
		Forest Area	0.029 sq km
		Kachcha Area	0.063 sq km
		Natural Vegetation in Wet Areas	0.012 sq km
		Pakka Planned Area	0.247 sq km
		Pakka Unplanned Area	2.017 sq km
		Range Land	0.002 sq km
		Bridges	5
		Bus Stops	1
		Education Facilities	59
		Health Facilities	2
		Mobile Towers	4
		Petrol Pumps	1
		Settlements	78
		Irrigation and Drainage Network	37.295 km
		Road Network	170.707 km
		Population	32860
		Household	6130
Heatwave	Low - High	Agriculture Area	69.741 sq km
		Kachcha Area	0.063 sq km
		Pakka Planned Area	0.248 sq km
		Pakka Unplanned Area	2.024 sq km
		Population	32964
		Household	6144
		Settlements	77
Meteorological Drought	Medium - Extreme	Agriculture Area	69.973 sq km
		Forest Area	0.339 sq km
		Natural Vegetation in Wet	0.766 sq km

		Areas	
		Range Land	0.04 sq km
		Water Body	2.542 sq km
		Wet Area	2.189 sq km
		Settlements	78
		Population	33310
		Household	6212
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Kurkali			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	77.923 sq km
		Forest Area	0.017 sq km
		Kachcha Area	0.013 sq km
		Pakka Planned Area	0.009 sq km
		Pakka Unplanned Area	3.678 sq km
		Range Land	0.094 sq km
		Bridges	3
		Education Facilities	61
		Health Facilities	1
		Mobile Towers	1
		Petrol Pumps	4
		Settlements	115
		Irrigation and Drainage Network	37.038 km
		Road Network	197.115 km
		Population	56932
		Household	10239
Heatwave	Low - High	Agriculture Area	77.849 sq km
		Kachcha Area	0.013 sq km
		Pakka Planned Area	0.009 sq km
		Pakka Unplanned Area	3.684 sq km
		Population	57014
		Household	10258

		Settlements	114
Meteorological Drought	Medium - Extreme	Agriculture Area	78.073 sq km
		Forest Area	0.174 sq km
		Range Land	1.856 sq km
		Water Body	0.684 sq km
		Wet Area	1.76 sq km
		Settlements	115
		Population	57561
		Household	10351
Agricultural Drought	Low	Agriculture Area	0.611 sq km
		Wet Area	0.002 sq km
		Population	13
		Household	2
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Lundo			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	12.035 sq km
		Forest Area	0.001 sq km
		Pakka Unplanned Area	0.908 sq km
		Range Land	0.027 sq km
		Education Facilities	13
		Settlements	15
		Irrigation and Drainage Network	4.537 km
		Road Network	21.552 km
		Population	11749
		Household	2153
Heatwave	Low - High	Agriculture Area	12.023 sq km
		Pakka Unplanned Area	0.912 sq km
		Population	11798
		Household	2163
		Settlements	15
Meteorological	Medium - Extreme	Agriculture Area	12.067 sq km

Drought		Forest Area	0.012 sq km
		Range Land	0.81 sq km
		Wet Area	0.367 sq km
		Settlements	15
		Population	11885
		Household	2179
Agricultural Drought	Low - Medium	Agriculture Area	9.042 sq km
		Forest Area	0.015 sq km
		Range Land	1.003 sq km
		Wet Area	0.454 sq km
		Settlements	7
		Population	7668
		Household	1406
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Maldasi			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	79.01 sq km
		Forest Area	0.01 sq km
		Pakka Planned Area	0.078 sq km
		Pakka Unplanned Area	2.478 sq km
		Range Land	0.005 sq km
		Bridges	1
		Education Facilities	69
		Health Facilities	5
		Petrol Pumps	1
		Settlements	67
		Irrigation and Drainage Network	17.028 km
		Road Network	166.125 km
		Population	32323
		Household	5932
Heatwave	Low - High	Agriculture Area	78.972 sq km
		Pakka Planned Area	0.078 sq km
		Pakka Unplanned Area	2.484 sq km
		Population	32407

		Household	5947
		Settlements	66
Meteorological Drought	Medium - Extreme	Agriculture Area	79.14 sq km
		Forest Area	0.18 sq km
		Range Land	0.034 sq km
		Water Body	2.834 sq km
		Wet Area	1.126 sq km
		Settlements	67
		Population	32794
		Household	6019
Agricultural Drought	Low	Agriculture Area	1.913 sq km
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Manik Thahim			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	76.604 sq km
		Forest Area	0.002 sq km
		Kachcha Area	0.034 sq km
		Pakka Planned Area	0.26 sq km
		Pakka Unplanned Area	2.42 sq km
		Range Land	0.001 sq km
		Bridges	3
		Education Facilities	51
		Health Facilities	1
		Mobile Towers	1
		Petrol Pumps	1
		Settlements	99
		Irrigation and Drainage Network	28.382 km
		Railway Line	0.27 km
		Road Network	182.503 km
		Population	38542
		Household	7196
Heatwave	Low - High	Agriculture Area	76.569 sq km
		Kachcha Area	0.034 sq km

		Pakka Planned Area	0.26 sq km
		Pakka Unplanned Area	2.427 sq km
		Population	38652
		Household	7217
		Settlements	97
Meteorological Drought	Medium - Extreme	Agriculture Area	76.701 sq km
		Forest Area	0.035 sq km
		Range Land	0.014 sq km
		Water Body	0.228 sq km
		Wet Area	0.307 sq km
		Settlements	99
		Population	39066
		Household	7290
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agriculture Drought	Nil	The US falls out of vulnerable zone for Agriculture Drought	

Mian			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	77.498 sq km
		Kachcha Area	0.318 sq km
		Natural Vegetation in Wet Areas	0.831 sq km
		Pakka Planned Area	0.078 sq km
		Pakka Unplanned Area	1.302 sq km
		Range Land	0.098 sq km
		Bridges	12
		Education Facilities	35
		Petrol Pumps	2
		Settlements	45
		Irrigation and Drainage Network	75.593 km
		Road Network	186.314 km
		Population	28821
		Household	5187

Meteorological Drought	Medium - Extreme	Agriculture Area	77.682 sq km
		Bare Area with sparse Natural Vegetation	1.072 sq km
		Natural Vegetation in Wet Areas	17.913 sq km
		Range Land	1.507 sq km
		Water Body	7.506 sq km
		Wet Area	10.575 sq km
		Settlements	45
		Population	29178
		Household	5250
Heatwave	Low - High	Agriculture	77.403 sq km
		Kachcha	0.319 sq km
		Pakka Planned	0.079 sq km
		Pakka Unplanned	1.306 sq km
		Population	28925
		Household	5207
		Settlements	45
Agricultural Drought	Low - Medium	Agriculture Area	0.279 sq km
		Bare Area with sparse Natural Vegetation	0.006 sq km
		Natural Vegetation in Wet Areas	6.207 sq km
		Range Land	0.002 sq km
		Water Body	6.77 sq km
		Wet Area	0.529 sq km
		Population	1
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Mir Hassan Mari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	69.304 sq km
		Forest Area	0.042 sq km
		Pakka Planned Area	1.581 sq km
		Pakka Unplanned Area	8.017 sq km
		Range Land	0.033 sq km
		Ambulance Services	2
		Bridges	4

		Bus Stops	2
		Education Facilities	97
		Fire Stations	1
		Grain Mandi	1
		Health Facilities	16
		Industry	1
		Mobile Towers	18
		Petrol Pumps	23
		Police Stations	2
		Post Offices	2
		Settlements	105
		Irrigation and Drainage Network	18.998 km
		Railway Line	10.79 km
		Road Network	201.636 km
		Population	197343
		Household	33664
Heatwave	Low - High	Agriculture Area	77.403 sq km
		Kachcha Area	0.319 sq km
		Pakka Planned Area	0.079 sq km
		Pakka Unplanned Area	1.306 sq km
		Population	28925
		Household	5207
		Settlements	45
Meteorological Drought	Medium - Extreme	Agriculture Area	69.545 sq km
		Forest Area	0.776 sq km
		Range Land	0.373 sq km
		Water Body	0.447 sq km
		Wet Area	1.244 sq km
		Settlements	105
		Population	198629
		Household	33891
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agriculture Area Drought	Nil	The US falls out of vulnerable zone for Agriculture Drought	

Mitho Khoso			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	64.635 sq km
		Forest Area	0.012 sq km
		Kachcha Area	0.106 sq km
		Pakka Planned Area	0.089 sq km
		Pakka Unplanned Area	2.442 sq km
		Range Land	0.012 sq km
		Bridges	3
		Bus Stops	3
		Education Facilities	47
		Health Facilities	2
		Mobile Towers	2
		Settlements	91
		Irrigation and Drainage Network	18.391 km
		Railway Line	5.518 km
		Road Network	160.27 km
		Population	40847
		Household	7604
Heatwave	Low - High	Agriculture Area	64.587 sq km
		Kachcha Area	0.105 sq km
		Pakka Planned Area	0.089 sq km
		Pakka Unplanned Area	2.45 sq km
		Population	40972
		Household	7626
		Settlements	89
Meteorological Drought	Medium - Extreme	Agriculture Area	64.783 sq km
		Forest Area	0.349 sq km
		Range Land	0.246 sq km
		Water Body	2.208 sq km
		Wet Area	2.725 sq km
		Settlements	91
		Population	41361
		Household	7696
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	

Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone
Agriculture Drought	Nil	The US falls out of vulnerable zone for Agriculture Drought

Nauabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	198.127 sq km
		Kachcha Area	0.19 sq km
		Natural Vegetation in Wet Areas	0.039 sq km
		Pakka Planned Area	0.131 sq km
		Pakka Unplanned Area	5.921 sq km
		Range Land	0.13 sq km
		Bridges	7
		Bus Stops	1
		Education Facilities	80
		Health Facilities	5
		Mobile Towers	6
		Petrol Pumps	4
		Police Stations	1
		Settlements	177
		Irrigation and Drainage Network	69.369 km
		Road Network	431.586 km
		Population	81739
		Household	14943
Heatwave	Low - High	Agriculture Area	197.963 sq km
		Kachcha Area	0.19 sq km
		Pakka Planned Area	0.131 sq km
		Pakka Unplanned Area	5.939 sq km
		Population	81984
		Household	14992
		Settlements	173
Meteorological Drought	Medium - Extreme	Agriculture Area	198.535 sq km
		Natural Vegetation in Wet Areas	2.182 sq km
		Range Land	2.413 sq km
		Water Body	0.114 sq km
		Wet Area	16.064 sq km
		Settlements	177
		Population	82676
		Household	15114

Agricultural Drought	Low - High	Agriculture Area	46.077 sq km
		Natural Vegetation in Wet Areas	2.133 sq km
		Range Land	2.463 sq km
		Water Body	0.007 sq km
		Wet Area	5.608 sq km
		Settlements	9
		Population	2089
		Household	375
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Peru Faqir Shoro			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	57.172 sq km
		Forest Area	0.016 sq km
		Kachcha Area	0.188 sq km
		Natural Vegetation in Wet Areas	0.006 sq km
		Pakka Planned Area	0.779 sq km
		Pakka Unplanned Area	2.12 sq km
		Range Land	0.012 sq km
		Bridges	1
		Education Facilities	37
		Health Facilities	1
		Mobile Towers	1
		Police Stations	1
		Settlements	75
		Irrigation and Drainage Network	16.486 km
		Railway Line	3.775 km
		Road Network	122.147 km
		Population	35900
		Household	6693
Heatwave	Low - High	Agriculture Area	57.095 sq km
		Kachcha Area	0.189 sq km
		Pakka Planned Area	0.781 sq km
		Pakka Unplanned Area	2.127 sq km

		Population	36019
		Household	6719
		Settlements	73
Meteorological Drought	Medium - Extreme	Agriculture Area	57.403 sq km
		Forest Area	0.394 sq km
		Natural Vegetation in Wet Areas	0.062 sq km
		Range Land	0.148 sq km
		Water Body	8.17 sq km
		Wet Area	2.55 sq km
		Settlements	75
		Population	36405
		Household	6788
Agricultural Drought	Low	Agriculture Area	3.712 sq km
		Water Body	0.261 sq km
		Wet Area	0.023 sq km
		Population	2
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Pritamabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	157.119 sq km
		Forest Area	0.008 sq km
		Kachcha Area	0.078 sq km
		Natural Vegetation in Wet Areas	0.208 sq km
		Pakka Unplanned Area	2.353 sq km
		Range Land	0.184 sq km
		Bridges	1
		Education Facilities	91
		Health Facilities	1
		Settlements	112
		Irrigation and Drainage Network	112.49 km
		Railway Line	1.703 km
		Road Network	420.446 km

		Population	37773
		Household	6792
Heatwave	Low - High	Agriculture Area	156.943 sq km
		Kachcha Area	0.078 sq km
		Pakka Unplanned Area	2.353 sq km
		Population	37773
		Household	6792
		Settlements	106
Meteorological Drought	Medium - Extreme	Agriculture Area	157.608 sq km
		Bare Area with sparse Natural Vegetation	50.06 sq km
		Forest Area	0.259 sq km
		Natural Vegetation in Wet Areas	2.793 sq km
		Range Land	1.73 sq km
		Water Body	1.021 sq km
		Wet Area	9.412 sq km
		Settlements	112
		Population	38179
		Household	6861
Agricultural Drought	Low - Medium	Agriculture Area	22.571 sq km
		Bare Area with sparse Natural Vegetation	40.916 sq km
		Forest Area	0.015 sq km
		Natural Vegetation in Wet Areas	0.147 sq km
		Range Land	0.797 sq km
		Water Body	0.753 sq km
		Wet Area	2.202 sq km
		Settlements	21
		Population	4033
		Household	725
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Runjho			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	120.592 sq km
		Kachcha Area	1.756 sq km
		Natural Vegetation in Wet Areas	0.035 sq km
		Pakka Unplanned Area	5.73 sq km
		Range Land	0.101 sq km
		Bridges	2
		Education Facilities	117
		Health Facilities	2
		Mobile Towers	2
		Police Stations	1
		Settlements	135
		Irrigation and Drainage Network	26.496 km
		Railway Line	4.273 km
		Road Network	195.391 km
		Population	55393
		Household	10787
Heatwave	Low - High	Agriculture Area	120.47 sq km
		Kachcha Area	1.764 sq km
		Pakka Unplanned Area	5.739 sq km
		Population	55528
		Household	10816
		Settlements	127
Meteorological Drought	Medium - Extreme	Agriculture Area	120.921 sq km
		Bare Area with sparse Natural Vegetation	200.776 sq km
		Natural Vegetation in Wet Areas	5.537 sq km
		Range Land	2.402 sq km
		Water Body	11.556 sq km
		Wet Area	4.177 sq km
		Settlements	135
		Population	56094
		Household	10921
Agricultural Drought	Low - High	Agriculture Area	39.383 sq km
		Bare Area with sparse Natural Vegetation	191.44 sq km
		Natural Vegetation in Wet Areas	3.694 sq km
		Range Land	2.639 sq km
		Water Body	8.952 sq km

		Wet Area	2.727 sq km
		Settlements	39
		Population	13467
		Household	2617
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sarhari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	60.402 sq km
		Forest Area	0.022 sq km
		Pakka Unplanned Area	2.698 sq km
		Range Land	0.056 sq km
		Bridges	1
		Education Facilities	73
		Health Facilities	2
		Mobile Towers	3
		Petrol Pumps	3
		Police Stations	1
		Post Offices	2
		Settlements	108
		Irrigation and Drainage Network	15.754 km
		Railway Line	5.231 km
		Road Network	147.212 km
		Population	44588
		Household	8332
Heatwave	Low - High	Agriculture Area	60.345 sq km
		Pakka Unplanned Area	2.702 sq km
		Population	44638
		Household	8345
		Settlements	103
Meteorological Drought	Medium - Extreme	Agriculture Area	60.615 sq km
		Bare Area with sparse Natural Vegetation	0.796 sq km
		Forest Area	0.292 sq km
		Range Land	0.902 sq km

		Water Body	0.023 sq km
		Wet Area	0.818 sq km
		Settlements	108
		Population	45144
		Household	8436
Agricultural Drought	Low - Medium	Agriculture Area	16.22 sq km
		Bare Area with sparse Natural Vegetation	0.988 sq km
		Forest Area	0.351 sq km
		Range Land	1.106 sq km
		Wet Area	0.071 sq km
		Settlements	19
		Population	5084
		Household	932
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sayyed Sibghatullah Shaheed			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	134.402 sq km
		Kachcha Area	0.17 sq km
		Natural Vegetation in Wet Areas	0.037 sq km
		Pakka Planned Area	0.279 sq km
		Pakka Unplanned Area	1.91 sq km
		Range Land	0.041 sq km
		Education Facilities	61
		Health Facilities	1
		Industry	4
		Settlements	91
		Irrigation and Drainage Network	62.034 km
		Road Network	242.787 km
		Population	31684
		Household	5703
Heatwave	Low - High	Agriculture Area	134.322 sq km
		Kachcha Area	0.171 sq km

		Pakka Planned Area	0.279 sq km
		Pakka Unplanned Area	1.915 sq km
		Population	31770
		Household	5717
		Settlements	87
Meteorological Drought	Medium - Extreme	Agriculture Area	134.573 sq km
		Natural Vegetation in Wet Areas	1.054 sq km
		Range Land	0.643 sq km
		Water Body	0.146 sq km
		Wet Area	7.072 sq km
		Settlements	91
		Population	32082
		Household	5770
Agricultural Drought	Low - Medium	Agriculture Area	30.42 sq km
		Natural Vegetation in Wet Areas	1.299 sq km
		Range Land	0.787 sq km
		Water Body	0.086 sq km
		Wet Area	5.013 sq km
		Settlements	10
		Population	2483
		Household	447
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Shah Mardan Abad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	106.197 sq km
		Kachcha Area	0.26 sq km
		Pakka Planned Area	0.884 sq km
		Pakka Unplanned Area	1.807 sq km
		Range Land	0.006 sq km
		Bridges	4
		Education Facilities	51
		Health Facilities	2
		Industry	1

		Mobile Towers	4
		Petrol Pumps	3
		Power Plants	1
		Settlements	78
		Irrigation and Drainage Network	56.003 km
		Road Network	236.352 km
		Population	36519
		Household	6566
Heatwave	Low - High	Agriculture Area	106.163 sq km
		Kachcha Area	0.26 sq km
		Pakka Planned Area	0.882 sq km
		Pakka Unplanned Area	1.809 sq km
		Population	36540
		Household	6568
		Settlements	77
Meteorological Drought	Medium - Extreme	Agriculture Area	106.295 sq km
		Range Land	0.031 sq km
		Water Body	0.091 sq km
		Wet Area	1.289 sq km
		Settlements	78
		Population	36919
		Household	6637
Agricultural Drought	Low	Agriculture Area	6.317 sq km
		Wet Area	0.009 sq km
		Population	7
		Household	2
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Shah Sikandarabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	84.666 sq km
		Forest Area	0.018 sq km
		Natural Vegetation in Wet	3.814 sq km

		Areas	
		Pakka Planned Area	0.02 sq km
		Pakka Unplanned Area	0.62 sq km
		Range Land	0.398 sq km
		Bridges	7
		Education Facilities	63
		Mobile Towers	1
		Petrol Pumps	3
		Police Stations	1
		Power Plants	1
		Settlements	57
		Irrigation and Drainage Network	112.198 km
		Road Network	322.724 km
		Population	10521
		Household	1894
Heatwave	Low - High	Agriculture Area	84.224 sq km
		Pakka Planned Area	0.02 sq km
		Pakka Unplanned Area	0.618 sq km
		Population	10491
		Household	1890
		Settlements	36
Meteorological Drought	Medium - Extreme	Agriculture Area	85.781 sq km
		Bare Area with sparse Natural Vegetation	43.171 sq km
		Forest Area	0.327 sq km
		Natural Vegetation in Wet Areas	152.955 sq km
		Range Land	12.824 sq km
		Water Body	41.754 sq km
		Wet Area	3.785 sq km
		Settlements	57
		Population	10720
		Household	1929
Agricultural Drought	Low - Extreme	Agriculture Area	2.088 sq km
		Bare Area with sparse Natural Vegetation	2.081 sq km
		Natural Vegetation in Wet Areas	73.652 sq km
		Range Land	8.707 sq km
		Water Body	23.927 sq km
		Wet Area	0.117 sq km
		Settlements	3
		Population	40

		Household	7
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Shahpur Chakar			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	29.844 sq km
		Forest Area	0.002 sq km
		Pakka Planned Area	0.192 sq km
		Pakka Unplanned Area	1.994 sq km
		Bridges	2
		Education Facilities	46
		Grid Stations	1
		Health Facilities	2
		Mobile Towers	3
		Petrol Pumps	4
		Police Stations	1
		Settlements	38
		Irrigation and Drainage Network	8.528 km
		Road Network	85.166 km
		Population	40647
		Household	7614
Heatwave	Low - High	Agriculture Area	29.822 sq km
		Pakka Planned Area	0.192 sq km
		Pakka Unplanned Area	1.997 sq km
		Population	40681
		Household	7618
		Settlements	38
Meteorological Drought	Medium - Extreme	Agriculture Area	29.9 sq km
		Forest Area	0.027 sq km
		Water Body	0.065 sq km
		Settlements	38
		Population	40958
		Household	7674
Agricultural Drought	Low	Agriculture Area	3.243 sq km

		Settlements	1
		Population	17
		Household	3
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sinjhoro			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	24.996 sq km
		Pakka Unplanned Area	1.078 sq km
		Education Facilities	22
		Health Facilities	2
		Mobile Towers	4
		Petrol Pumps	4
		Police Stations	1
		Post Offices	1
		Settlements	18
		Irrigation and Drainage Network	11.215 km
		Road Network	57.669 km
		Population	23317
		Household	4000
Heatwave	Low - High	Agriculture Area	24.977 sq km
		Pakka Unplanned Area	1.077 sq km
		Population	23298
		Household	3994
		Settlements	17
Meteorological Drought	Medium - Extreme	Agriculture Area	25.032 sq km
		Water Body	0.031 sq km
		Wet Area	1.541 sq km
		Settlements	18
		Population	23496
		Household	4029
Agricultural Drought	Low	Agriculture Area	3.014 sq km
		Wet Area	0.009 sq km
		Population	7
		Household	1

Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone

Sitharpir			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	122.931 sq km
		Kachcha Area	0.722 sq km
		Natural Vegetation in Wet Areas	0.012 sq km
		Pakka Planned Area	0.186 sq km
		Pakka Unplanned Area	2.378 sq km
		Range Land	0.005 sq km
		Bridges	4
		Bus Stops	3
		Education Facilities	27
		Health Facilities	2
		Mobile Towers	2
		Petrol Pumps	2
		Police Stations	1
		Post Offices	1
		Settlements	112
		Irrigation and Drainage Network	57.717 km
		Road Network	289.665 km
		Population	47018
		Household	8447
Heatwave	Low - High	Agriculture Area	122.837 sq km
		Kachcha Area	0.723 sq km
		Pakka Planned Area	0.187 sq km
		Pakka Unplanned Area	2.382 sq km
		Population	47108
		Household	8464
		Settlements	112
Meteorological Drought	Medium - Extreme	Agriculture Area	123.126 sq km
		Natural Vegetation in Wet Areas	0.079 sq km
		Range Land	0.133 sq km

		Water Body	0.027 sq km
		Wet Area	8.204 sq km
		Settlements	112
		Population	47561
		Household	8544
Agricultural Drought	Low	Agriculture Area	19.408 sq km
		Range Land	0.162 sq km
		Wet Area	0.502 sq km
		Settlements	1
		Population	81
		Household	14
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Soomar Faqir Hingoro			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	68.877 sq km
		Forest Area	0.007 sq km
		Pakka Planned Area	0.048 sq km
		Pakka Unplanned Area	1.641 sq km
		Range Land	0.047 sq km
		Education Facilities	57
		Health Facilities	1
		Post Offices	1
		Settlements	60
		Irrigation and Drainage Network	14.891 km
		Railway Line	5.139 km
		Road Network	130.531 km
		Population	21220
		Household	3893
Heatwave	Low - High	Agriculture Area	68.838 sq km
		Pakka Planned Area	0.048 sq km
		Pakka Unplanned Area	1.646 sq km
		Population	21290
		Household	3904
		Settlements	59

Meteorological Drought	Medium - Extreme	Agriculture Area	69.009 sq km
		Forest Area	0.132 sq km
		Range Land	2.076 sq km
		Water Body	0.613 sq km
		Wet Area	1.722 sq km
		Settlements	60
		Population	21495
		Household	3939
Agricultural Drought	Low	Agriculture Area	0.812 sq km
		Forest Area	0.131 sq km
		Range Land	1.669 sq km
		Water Body	0.208 sq km
		Wet Area	0.003 sq km
		Population	5
		Household	1
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

ORGANIZATION STRUCTURE FOR DISASTER MANAGEMENT AT DISTRICT LEVEL

INTRODUCTION

Each year natural disasters kill thousands of people and inflict billions of dollars in economic losses. No nation or community is immune to the damage of disasters and certainly, the province of Sindh is no exception. Almost every year, a major or minor natural disaster disrupts the life and economy of people living in the province, especially those with high economic vulnerability or the poor strata of the population. Unless action is taken to reduce the toll of natural disasters, the damages and losses of disasters can only be expected to rise. The scientific and technological advances of today's world provide unprecedented opportunities for responding to the urgent need to mitigate the impacts of natural hazards.

It is a globally recognized fact that natural hazards do not kill but poor planning does. Better disaster management and disaster risk reduction can only be achieved through collective efforts in integrating hazard reduction policy and practice throughout the province. It is a need of the time and opportunity to reassess the approach to natural hazards and to develop strategies for reducing losses by prevention and preparedness.

Disaster management can be achieved through the collective effort of all segments of life. A central authority, like Provincial Disaster Management Authority, can oversee, plan, manage and coordinate for disaster management at the provincial scale, however, it is the responsibility of concerned departments and authorities to implement and execute disaster management measures at the grass-root level. For effective disaster management, it is also imperative to take onboard and empower communities at high disaster risk as first responders. The disaster management plan will be effective once the roles and responsibilities of each individual and department are well understood and disaster management measures are implemented.

Keeping in view the importance of disaster management at all levels i.e., from the Provincial level to UC or village level, different disaster management committees have been recommended to be constituted. These committees are District Disaster Management Authority (DDMA), Taluka Disaster Management Committee (TDMC), and Union Council Disaster Management Committee (UCDMC). The recommended composition of each committee is given in Table-2 to 4.

Table 2: District Disaster Management Authority

Sr.#	Committee Representative	Role
1.	Deputy Commissioner	Chairperson
2.	Additional Deputy Commissioner	DDMO
3.	Senior Superintendent of Police	Member
4.	Assistant Director Local Government	Member
5.	District Information Officer	Member
6.	Cantonment Officer (Where Applicable)	Member
7.	District Health Officer	Member
8.	District Education Officer	Member
9.	District Food Controller	Member
10.	Deputy Director Civil Defense	Member

11.	District Officer Social Welfare	Member
12.	District Officer Livestock	Member
13.	District Chairman Zakat	Member
14.	Executive Engineer (Works and Services)	Member
15.	Executive Engineer Irrigation	Member
16.	Executive Engineer Public Health	Member
17.	Municipal Commissioners / CMOs / TMOs	Member(s)
18.	Representative Officer of Armed Forces	Member
19.	Two Elected Representatives nominated by the chair	Members
20.	Two Representatives of NGOs/Civil Society	Members
21.	Two Representatives of Business Community	Members
22.	Representative of Agriculture and Livestock Department	Member
23.	Representative of NHA	Member
24.	Representative of Electric Supply Corporation	Member
25.	Representative of SSGC	Member
26.	Representative of Red Crescent	Member
27.	Representative of Sindh Scouts	Member
28.	Representation of Volunteers from Communities at Risk	Member(s)

Table 3: TDMC Taluka Disaster Management Committee

Sr.#	Committee Representative	Role
1.	Assistant Commissioner	Chairperson
2.	Mukhtiarkar	Secretary
3.	Town Municipal Officer (TMO)	Member(s)
4.	Sub Divisional Police Officer	Member
5.	Taluka Education Officer	Member
6.	Medical Superintendent Taluka Level Medical Facility	Member
7.	Representative from Civil Defense	Member
8.	Representative from Social Welfare Department	Member
9.	Representative from Livestock Department	Member
10.	Assistant Engineer (Works and Services)	Member
11.	Assistant Engineer Irrigation	Member
12.	Assistant Engineer Public Health	Member
13.	Two Representatives of NGOs/Civil Society	Members
14.	Two Representatives of Business Community	Members
15.	Representative of Agriculture and Livestock Department	Member
16.	Representative of Electric Supply Corporation	Member
17.	Representative of SSGC	Member
18.	Representative of Red Crescent	Member
19.	Representative of Sindh Scouts	Member
20.	Representation of Volunteers from Communities at Risk	Member

Table 4: UCDMC Union Council Disaster Management Committee

Sr.#	Committee Representative	Role
1.	UC Administrator	Chairperson
2.	Secretary UC	Secretary
3.	Station House Officer (Police) – Concerned	Member

4.	Two Representatives of NGOs/Civil Society	Members
5.	Representation of Volunteers from Communities at Risk	Members
6.	Representation of Renowned Persons	Members

RESPONSIBILITY OF DISTRICT DISASTER MANAGEMENT AUTHORITY

- The DDMA shall work as a coordinating body of all government agencies and non-government organizations operating in the district and act as a focal authority in the conduction and implementation of plan and actions on disaster management
- Additional Deputy Commissioner who is proposed as Disaster Management Officer shall also work as Secretary DDMA and will provide administrative support to DDMA
- The DDMA shall ensure to take all possible disaster management measures in the district in accordance with the guidelines laid down by PDMA or NDMA
- The DDMA shall provide leadership by taking initiative to achieve MHVRA Informed Disaster Management Plan goals and objectives
- The DDMA shall coordinate with PDMA Sindh in disaster preparedness, response and recovery
- The DDMA shall provide guidance and support for the implementation of district response plans including management of the District Emergency Operation Centre

FUNCTION OF DDMA

- To review district disaster management plan, including district response plan in-line with Provincial and National disaster management plans and policies
- To ensure that risk maps are developed and updated and disaster-prone areas have been identified and prioritized in the district
- To coordinate the efforts for prevention and mitigation measures that are undertaken by the government and local authorities in the identified vulnerable areas of the district
- To organize and coordinate specialized disaster management training programs for different levels of officers, employees, and volunteer rescue workers in the district
- To facilitate community training and awareness programs with the support of local authorities, government and non-government organizations

- To set up, maintain, review and upgrade the mechanism for early warning and dissemination of accurate information to concerned authorities and the general public

- To review development plans prepared by the government departments, statutory or local authorities with a view that disaster management plan has been integrated into the development activities and projects of the plan

- To coordinate with, and give guidelines to, local authorities in the district to ensure that pre-disaster and post-disaster management activities in the district are carried out promptly and effectively

- To prepare, review and update district level response and contingency plans.

- To identify buildings and places which could, in the event of disaster situation be, used as relief centers and camps and make arrangements for water supply and sanitation in such buildings or places

- To distribute relief and facilitate rescue or ensure disaster preparedness and response

- To ensure operationalization of District Emergency Operation Centre (DEOC) equipped with all necessary gadgets

- To activate the District Emergency Operations Centre (DEOC) and ensure its uninterrupted operation during and after disaster events

- To carry out rapid damage and needs assessment and develop a report for assisting PDMA and other relevant stakeholders

- To coordinate and monitor early recovery and rehabilitation activities with the support of PDMA or relevant local and international stakeholders

- To prepare and continuously update databases of external agency projects, future priority areas, funding framework, available resources, areas of operations/expertise etc.

- To perform other functions as deemed necessary by the provincial government or provincial authority for disaster management in the district

RESPONSIBILITY OF TALUKA DISASTER MANAGEMENT COMMITTEE

- The TDMC shall work as front-line body for disaster management in the district and shall ensure implementation of disaster management measures set by DDMA and PDMA

- The TDMC shall interface directly with communities at risk in disaster preparedness, disaster risk reduction and response
- The TDMC shall bridge between government and communities in disaster response
- The TDMC shall coordinate between DDMA, PDMA and all stakeholders working at grass-root level in pre, during and post disaster events

FUNCTION OF TALUKA DISASTER MANAGEMENT COMMITTEE

- Identification and updation of all hazards in their respective locations and conduct of risk and vulnerability analysis and communicate with DDMA and subsequently with PDMA
- Ensure that the officers and employees are trained in disaster management
- Ensure that resources relating to disaster management are maintained and readily available for use in the event of any threatening disaster situation or disaster
- To coordinate and monitor disaster management plan mainstreaming operations in the district and over all disaster management initiatives
- Land use planning and zoning within the municipality by preparing master plans while keeping the multi hazard of the municipality and Taluka in context
- To ensure the implementation of bylaws related to encroachment at hazardous places, building codes, land use planning and zonation etc.
- To identify evacuation/shelter places to face any disaster/emergency
- To monitor the disaster management activities of NGOs, UCDMCs and private sectors
- To share initial damage and needs assessment reports to DDMA and subsequently to PDMA
- To carry out relief, rehabilitation and reconstruction activities in the affected areas in accordance with the DDMA and PDMA

RESPONSIBILITY OF UNION COUNCIL DISASTER MANAGEMENT COMMITTEE

1. UCDMC shall work as front-line, first responder body at village, mohalla and ward level.
2. Shall assist TDMC, DDMA and PDMA especially in disaster response.
3. Shall encourage and keep record of volunteers in Union Council.

4. Shall formulate different groups to respond disaster and emergency events such as evacuation group, camp management group etc. and share this record with TDMC, DDMA and PDMA.

5. Shall prepare awareness and capacity development proposals and training programs and follow-up with TDMC, DDMA and PDMA for arranging such events at grass root level.

FUNCTION OF UCDMC

1. Identification and updation of all hazards in their respective locations and conduct of risk and vulnerability analysis and communicate with TDMC, DDMA and subsequently with PDMA.

2. To prepare/update UC level disaster management plan for emergent hazards or new hazards caused by any disaster event.

3. To make an analysis of disaster risk and to prepare a list of vulnerable villages and areas of the concerned union councils.

4. To mobilize community for maintaining public ways, public streets, culverts, bridges and public buildings, and other development activities.

5. To coordinate with the village and neighborhood UCs in case of emergency in order to get quick information about the severity and extent of a disaster impact and report it to the TDMC and DDMA.

6. To report cases of handicapped, destitute and socially excluded groups to TDMC, DDMA and PDMA in order to streamline their special needs in relief and response operation.

7. Mobilizing and coordinating work of volunteers and ensuring community participation.

8. Conduct of search and rescue operations in coordination with the rescue teams and Police.

9. To provide assistance to other agencies for mobility/transport of staff, including rescue parties, relief personnel and relief materials. To communicate with the TDMC, DDMA or PDMA for required additional resources.

10. To monitor NGO activities and provide necessary support to ensure community participation by establishing coordination mechanisms among NGOs and local communities.

ESTABLISHMENT OF EMERGENCY OPERATION CENTERS

PROVINCIAL EMERGENCY OPERATION CENTER (PEOC)

As envisioned by PDMA Sindh, PEOC is established at HQ of PDMA Sindh. The center is equipped with modern tools and techniques for management and operation activities in pre, during and post disaster events. The center works under the management of PDMA with 24/7 operation.

The functions of PEOC are summarized below;

- Coordinating node for planning, management and operations of disaster management activities
- Inventory management and goods distribution.
- Assets and vehicles management and monitoring
- Monitoring of extreme weather and disasters
- Issuance of early warnings
- Disposal and monitoring of man and material resources during disaster events
- Coordination with community based associations, volunteers, NGOs and other relevant institutions involved in disaster management
- Assessment of disaster risk and elements at risk and dissemination of information to concerned departments
- Coordination for evacuation, medical, search, rescue and relief
- Preparation and collection of damage assessment reports
- Coordination with all management tiers
- Daily briefings on disaster events, search and rescue operations, damages and losses, recovery and rehabilitation
- Hosting of online meetings
- Damage data collection through imaging drones

DISTRICT EMERGENCY OPERATION CENTER (DEOC)

The PEOC established at PDMA HQ is connected with districts through DEOC. The DEOC is supposed to work as filed arm of PEOC for execution and implementation of instructions passed on by PEOC. The center is equipped with modern tools and techniques for management and operation activities in pre, during and post disaster events. The center works under the management of DDMA with 24/7 operation during disasters.

FUNCTION OF DEOC

The functions of DEOC are appended below;

- Receive information and instructions from PEOC regarding implementation and execution of action plans
- Monitor the situation and put everything ready and functional in the DEOC
- Dissemination of early warnings issued from PEOC to stakeholders and communities
- To coordinate with PEOC, PDMA, concerned departments and other stakeholders
- To monitor emergency operations and make efforts for preventing secondary hazards
- To conduct rapid assessment of the relief needs by collecting information from affected areas and circulate to PDMA and other concerned departments and stakeholders
- To deploy evacuation, medical, search and rescue teams in the affected areas
- To provide relief assistance in terms of relief camps, medical and sanitation facilities and temporary shelter to the affected population in the district
- To establish a liaison with concerned departments and stakeholders engaged in emergency response by anticipating resource inventory
- To collect information for daily briefings on disaster situation for PEOC, media, general public and other stakeholders
- Record keeping and preparation of consolidated reports and response plans and projects.
- Coordination and mobilization of community based associations, volunteers, NGOs and other relevant institutions involved in disaster management

SECTOR WISE ROLES AND RESPONSIBILITIES OF GOVERNMENT FUNCTIONARIES

AGRICULTURE AND LIVESTOCK DEPARTMENT

Pre-Disaster

- Capacity building of department regarding disaster management and risk reduction and implementation of sector specific disaster risk reduction measures
- Provide recommendation on changing/rescheduling of cropping patterns with respect to changing climate and weather scenarios
- Create Community Seed Bank at Union Council level
- Provide livestock vaccination and de-worming
- Assessment of high prone areas and estimation of possible damage and needs for recovery regarding livestock, crops, in case of any disaster
- Mass awareness regarding epidemics and diseases to livestock and crops
- Close coordination with PDMA and DDMA

During-Disaster

- Close and regular coordination with DDMA and PDMA
- Immediate transfer of current situation to DDMA and PDMA
- Vaccination of livestock

Post-Disaster

- Facilitation to institutions / NGOs/ INGOs which focus on rehabilitation activities as per guidelines provided by DDMA and PDMA
- Submit report on damages and needs to DDMA and PDMA
- Mass awareness regarding epidemics and diseases to livestock and crops
- Vaccination of livestock
- Upgrade Community Seed Bank (CSB)
- Timely compensation to affected farmers

- Prepare overall report of the department regarding intervention and disseminate to DDMA and PDMA

PROVINCIAL DISASTER MANAGEMENT AUTHORITY (PDMA)

Pre-Disaster

- Close coordination with national and international institutions engaged in disaster forecasting.
- Coordinate meeting and engage DDMA for preparation of anticipated disasters
- Ensure readiness of equipment and inventory
- Disseminate disaster alerts to concerned DDMA with action plans for forecastable disasters
- Ensure availability of relief goods and other relevant stuff before anticipated disaster
- Advise concerned departments on removal of congestion from water ways before monsoon period
- Aware and sensitize public and private departments on main streaming disaster risk reduction in developing planning
- Ensure availability and functioning of provincial emergency operation center
- Provide and report high risk population and infrastructure in anticipated hazard areas.
- Capacity building of line and stakeholder department on disaster risk reduction and management.

During-Disaster

- Coordination and mobilization of man and material resources
- For rescue and evacuation of people, provide and manage temporary shelter and life restoration equipment in disaster affected regions
- Coordinate with line departments for health and veterinary services in the affected regions and ensure to control outbreak of any communicable diseases
- Coordinate with DDMA and line departments

- Coordinate with individual donors, donor organizations, NGOs and INGOs and ensure distribution of relief among disaster affectees

Post-Disaster

- Coordination with DDMA and line departments for need and damage assessment
- Need and damage assessment reporting to higher management, NGOs, INGOs and other agencies for rehabilitation
- Ensure rehabilitation on build back better principle

DISTRICT DISASTER MANAGEMENT AUTHORITY (DDMA)

Pre-Disaster

- Close coordination with PDMA and other relevant stakeholders
- Risk assessment and identification of disaster-prone areas
- Aware and sensitize public and private departments on main streaming disaster risk reduction in developing planning
- Coordinate meeting and engage TDMC for preparation of anticipated disasters.
- Ensure readiness of equipment and inventory
- Disseminate disaster alerts to concerned TDMC with action plans for forecastable disasters
- Ensure availability of relevant staff before anticipated disaster
- Advise concerned departments on removal of congestion from water ways before monsoon period
- Ensure availability and functioning of district emergency operation center
- Arrange emergency response exercises and drills along with volunteer groups, social welfare and civil defense on various disaster scenarios

During-Disaster

- Mobilization of man and material resources
- For rescue and evacuation of people, provide and manage temporary shelter and life restoration equipment in disaster affected regions
- Coordinate with TDMC and line departments
- The DDMA shall lead the evacuation of people to safer places with the assistance of PDMA. DDMA shall also ensure safety, security, supply chain, life commodities and management of relief camps
- Only authorized officials of DDMA shall brief media on disaster situation and the response activities.

Post-Disaster

- Coordination with TDMC and line departments for need and damage assessment
- Need and damage assessment reporting to PDMA
- Ensure rehabilitation on Build Back Better principle

CIVIL DEFENSE

Pre-Disaster

- Assign representatives for DDMA to participate in meetings
- Information sharing regarding capacities and needs of Civil Defense department regarding disaster risk management
- Capacity building of Civil Defense department regarding disaster risk management
- Information sharing regarding technical and personnel expertise with DDMA
- Conduct trainings for Volunteers regarding Rescue and other relevant expertise in collaboration with Health department and PDMA
- Create awareness regarding rescue, evacuation and first aid
- Effectively establish, train and systemize volunteers' initiatives in collaboration with education department / institutions

During-Disaster

- Fire fighting
- Rescue and evacuation
- Assign volunteers in coordination with PDMA and DDMA
- Communicate to DEOC about details of all activities
- Communicate to DEOC any additional resources required for performing the above tasks
- Facilitate line departments as per demand in disaster response

Post-Disaster

- Assist in rehabilitation process if required

EDUCATION DEPARTMENT

Pre-Disaster

- Assign representatives for DDMA and participate in meetings
- Information sharing regarding capacities and needs of Education department regarding disaster risk management
- Teachers and students are informed about the disaster prone areas of the district
- Teachers and students are informed of their responsibilities to take care of materials and documents to safe places during disaster
- Facilitate and collaborate with PDMA in preparation of disaster management curriculum
- Collaborate with PDMA and DDMA in synergizing volunteers

During-Disaster

- Mobilize human resources for intervention during disaster
- Inform schools situated in high risk areas about hazard and hazard forecast
- Assist in arrangement of relief and shelter camps in educational institutes for the disaster affectees

- Facilitate Health department and other relevant entities in arranging medical camps, blood donations and provision of medical aid during disaster and emergencies
- Coordinate with PDMA and DDMA in assigning volunteers for emergency response

Post-Disaster

- Assessment of damages occurred to educational institutes
- Provide assistance to teachers, students and other staff who are victimized by disasters (lack of food, shelter, etc.)
- Rehabilitation and reconstruction of affected educational facilities
- Facilitate institutions / NGOs / INGOs which focus on rehabilitation of educational facilities
- Prepare overall report of the department regarding intervention and disseminate to PDMA and DDMAs

FINANCE DEPARTMENT

Pre-Disaster

- Regular coordination with PDMA
- Allocate budget on contingency basis, to handle any emergency situations
- Facilitate other departments in planning and meeting their financial needs

During-Disaster

- Provide funds to PDMA and other line departments for procurement of material and equipment required for emergency response
- Provide funds to PDMA and other line departments for rescue and relief activities

Post-Disaster

- Get statistical data regarding actual damage and recovery needs from all line departments
- Provide funds for execution of rehabilitation process

HEALTH DEPARTMENT

Pre-Disaster

- Assign representatives for DDMA, and participate in meetings
- Information sharing regarding capacities and needs of Health department regarding disaster risk management
- Build capacity of health department regarding disaster risk management and preventive health care especially in disaster prone areas
- Monitor the general health situation, e.g. monitor outbreak of diseases
- Provide specific information required regarding precautions for epidemics
- Establish a health mobile team in district and taluka headquarter hospital
- Set-up an information Centre to organize sharing of information for public information purposes
- Prepare first aid kits, medicines, water test kits, chloramines and anti-snake venom serum.
- Collaboration with relevant organizations / partner NGOs for participation and support through technical resources
- Up-gradation and smooth functioning of hospitals, BHUs, equipped with required staff, medicines and equipment
- Database and linkages with ambulance services/blood banks
- Health and hygiene awareness and education
- Ensure proper disposal of hospital waste

During-Disaster

- Provide emergency treatment for the seriously injured
- Ensure emergency supplies of medicines and first-aid
- Supervise food, water supplies, sanitation and disposal of waste

- Assess and co-ordinate provision of ambulances and hospitals where they could be sent (public and private);
- Provide special information required regarding precautions for epidemics
- Set-up an information Centre to organize sharing of information for public information purposes
- Conduct disaster impact assessment on health
- Intervene in case of disease outbreak
- Medical camps and vaccination
- Ongoing surveillance with regard to health issues and disease outbreaks

Post-Disaster

- Conduct disaster impact assessment on health situation
- Prepare plan for the following year along with reports and submit to PDMA and concerned department.
- Medical camps and vaccination
- Rehabilitation of health infrastructure affected during disaster
- Preparation of impact assessment surveys covering strengths and weaknesses of interventions and impact on affected victims and dissemination of learning to PDMA and other concerned institutions

INFORMATION DEPARTMENT

Pre-Disaster

- Close coordination and liaison with PDMA and DDMA
- During monsoon season and forecastable hazards issuance of press releases regarding hazards and preparedness plans of the government
- Issue and publish disaster alerts on appropriate media forums
- Coverage and publication of government initiatives on disaster risk reduction and management

- Ensure media coverage and publication of PDMA and DDMA meetings for pre disaster preparations

During-Disaster

- Coordination with PDMA and DDMA for announcement of warnings and updates on disasters
- Publication of bulletins on government actions, facilities, relief and rescue efforts
- Publication of camp management and relief distribution announcements
- Publication of safety measures during disasters to minimize disaster domino effects
- Communicate voice of affectees to concerned departments

Post-Disaster

- Focus on problems being faced by the people of the affected area
- Publish, broadcast /telecast programs highlighting strengths, weaknesses and scams in disaster response activities
- Publish, broadcast /telecast programs highlighting government initiatives and collective response of NGOs, INGOs and other departments for relief and rehabilitation

PAKISTAN METEOROLOGICAL DEPARTMENT (PMD)

Pre-Disaster

- Update and upgrade forecast equipment
- Timely and authentic forecast of rains, windstorms and other forecastable hazards
- Timely transfer of information regarding abnormal weather conditions to PDMA

During-Disaster

- Forecasting for any confluencing disaster
- Issuance of precautionary measures to avoid domino effects of disaster

Post-Disaster

- Technical assistance in rescue and rehabilitation process

POLICE DEPARTMENT

Pre-Disaster

- Coordinate with the DDMA in the pre-disaster planning
- Participate in DDMA meetings
- Capacity building of Police department regarding disaster risk management
- Information dissemination through 15 helpline service to local residents
- Prepare team for emergency intervention
- Prepare plan for shifting to safer places and early warning system

During-Disaster

- Co-ordinate with DEOC
- Assistance in shifting of rescued/affected people to relief camps and hospitals
- Provide protection and easy access to rescue and relief personnel/vehicles
- Maintain law and order
- Provide warning / instruction to travelers
- Divert traffic on alternate routes as and when necessary
- Ensure security to workers of NGOs and INGOs who perform duties for disaster response
- Ensure safety and security of relief goods and maintain discipline during relief distribution process
- Provide security in Relief Camps

Post-Disaster

- Assist in relief and rehabilitation process

REVENUE DEPARTMENT

Pre-Disaster

- Assign representatives for DDMA, and participate in meetings
- Information sharing regarding capacities and needs of Revenue department regarding disaster risk management
- Capacity building of Revenue department regarding disaster risk management
- Assessment of high prone areas and estimation of possible damage and needs for recovery in case of emergency
- Arrangement of financial resources
- Facilitate getting tax exemptions to institutions/NGOs/INGOs focus on disaster risk management
- Collect and update population data at village level

During-Disaster

- Coordination with the DEOC
- Establish relief distribution centers
- Accept relief donations and relief support
- Timely release of funds

Post-Disaster

- Allocation of funds for recovery and rehabilitation process
- Assessment of damage of crops and livestock and settlement of applicable taxes accordingly in coordination with relevant departments

ARMED FORCES

Pre-Disaster

- Coordinate with the DDMA in the pre-disaster planning

- Prepare necessary equipment, labor, transportation and other materials for emergency interventions
- Assist in evacuation of people to safe places

During-Disaster

- Maintain liaison with the DEOC for vital inputs during response
- Collect information and warn appropriate Army units for engagement in safety, rescue and evacuation activities
- Establish communication infrastructure and supplement the civil communication set-up if required
- Coordinate all military activity required by the civil administration
- Provision of medical care with the help of the medical teams, including treatment at the nearest armed forces hospital
- Transportation of relief material
- Provision of logistic back-up (aircrafts, helicopters, boats)
- Assist in establishment of Relief Camps
- Assist in evacuation of people to safe places during the disaster

Post-Disaster

- Cooperate and coordinate with district authorities
- Assist in rehabilitation process if required

SOCIAL WELFARE AND COMMUNITY DEVELOPMENT

Pre-Disaster

- Coordination with NGOs and civil society organizations working for disaster risk management
- Empower the extremely vulnerable people emphasizing women and children through public awareness involving respective departments for various fields such as Education, Health etc.
- Capacity building of community based groups and volunteers engaged in disaster management activities

During-Disaster

- Provide information on the situation of the disaster to the DEOC
- Coordinate all NGOs / INGOs and civil society organizations working during the emergency response
- Monitor progress of relief operations in the affected areas
- In coordination with PDMA, Health, Revenue and other line departments, ensure delivery of relief to most vulnerable segments of society such as children, orphans, widows, destitute
- Assist and facilitate Damage and Needs Assessment teams from NGOs
- Share human resources with DDMA

Post-Disaster

- Monitor and follow up the status of the extremely vulnerable people
- Assist and facilitate Damage and Needs Assessment teams from NGOs
- Conduct impact assessment studies and analysis of strengths and weaknesses of stakeholders and disseminate learning to PDMA, DDMA and other concerned institutions
- Facilitate institutions / NGOs/ INGOs which focus on rehabilitation activities

NGOs / INGOs

Pre-Disaster

- Facilitate PDMA and DDMA for capacity building regarding disaster risk management
- Capacity building of community groups regarding disaster risk management
- Linkages with concerned departments and institutions for providing technical and financial resources regarding diverse sectors related to disaster management
- Resource mobilization at local and international level

During-Disaster

- Collaborate and facilitate in relief operations

- Incorporate local and international expertise in disaster response
- Facilitate establishment of temporary shelters and camps
- Facilitate in overall disaster response in collaboration with concerned departments
- Regular updates and alerts to local and international partners
- Utilization of existing resources and further mobilization at local and international level
- Assessment of losses using sphere standards

Post-Disaster

- Collaborate and facilitate in rehabilitation activities
- Incorporate local and international expertise in rehabilitation activities
- Facilitate overall rehabilitation in collaboration with concerned departments
- Impact assessment studies and sharing findings with PDMA, DDMA, local and international partners
- Linkages with partners for sustainable resources mobilization

DISASTER MANAGEMENT GUIDELINES

INTRODUCTION

Multi-hazard vulnerability Risk Assessment of Sanghar district reveals that the district is relatively safe in terms of natural disasters. The pertinent hazards to district are meteorological hazards including drought and Heatwave. The risk of geophysical hazards is low in the district. In modern technological era, meteorological hazards can be precisely forecasted and action can be taken well in time to minimize damages and losses. In other words, the vulnerabilities and risks are manageable and losses and damages can be minimized through adoption of best management practices and mobilization of resources.

These guidelines introduce best practices which can be adopted to manage risk of natural disasters in the district.

Riverine Flood	According to MHVRA Study 2022, there is no riverine flood hazard in district Sanghar
Earthquake	1. The geology of Sindh is divisible in three main regions, the mountain ranges of Kirthar, Pab containing a chain of minor hills in the west and in east it is covered by the Thar Desert and part of Indian Platform where the main exposure is of Karoonjhar Mountains, which is famous for Nagar Parkar Granite. 2. Some of prominent faults situated in Sindh are (a) Karachi-Jati, (b) Surjan-Jhimpir, (c) Pab Fault (d) Hub Fault and (e) Allah Bund-Rann of Kutch faults. 3. Though risk of geophysical hazards in Sanghar district is low but still some actions must be taken to avoid losses in case of minor jolts. Urban settings are most likely to be affected by jolts. It is highly recommended to identify old and weak buildings in the cities and other urban settings of the district. Local concerned authorities may decide evacuation or retrofitting of such buildings / structures. 4. It is also recommended that, new housing schemes, societies and infrastructure be built with proper town planning and following Building Codes recommended for the zone in which Sanghar district is situated. 5. Local government departments must be strengthened to manage situation arisen from earthquake jolts. Strengthening must include capacity building to act as first responder in any likely situation.

Heatwave	1. Historically, Sanghar district has a Hot and Semi-Arid climate and is prone to severe heatwave seasons. However, most of the district is sparsely populated, which significantly lowers the chances of severe heatwave impacts. 2. Heatwaves are forecastable hazards and actions can be taken well before occurrence of heatwaves. The most suitable action is issuance of warnings and alerts in public for precautions and safety. Suitable media for the purpose is social media and SMS. 3. Scientific studies suggest that, frequency and intensity of heatwaves is increased due to climate change. Though climate change is global phenomena, however, its impacts can be minimized through local interventions. The most efferent and cost-effective solution is tree plantation. Tree plantation must be encouraged at levels including government functionaries, NGOs, community and individual levels. 4. Additionally, introduction of reduced Urban Heat Islands (UHI)through policies and implementation in infrastructure development will significantly reduce impacts of heatwaves.
Cyclone	According to MHVRA Study 2022, there is no Cyclone hazard in district Sanghar
Drought	1. Geographically, district Sanghar has Hot and Semi-Arid climate. Rainfall is insufficient, average annual rainfall across the district is only 158.14mm. 2. Drought is also forecastable hazard and can be predicted well in advance. Though drought does not bring any prominent or famine like conditions in the district, however, it causes reduction in agricultural production and some extent disturb food supply for the animals and livestock. The best practice to manage drought related impacts is storage of food supplies for both humans and animals. 3. The situation of drought may vary in future due to climate change effects, therefore, introduction of drought resilient crops is need of the time. Additionally, efficient use of available water resources and introduction of efficient agricultural systems is also required.

	4. Further, farmers may be encouraged for alternative crops during expected drought seasons. Also policies for compensation of framers must also be introduced to assist and encourage drought hit farmers.
Tsunami	According to MHVRA Study 2022, there is no Tsunami hazard in district Sanghar

STANDARD OPERATING PROCEDURES

INTRODUCTION

Overall, disaster risk reduction is collective responsibility of concerned departments, associated line departments, private sector and communities. Synergized and coherent efforts are required at each cycle of disaster in order to minimize and avoid disaster losses and damages. The implementation of this disaster management plan would only be possible until roles and responsibilities of every department are defined and well understood.

ACTION PLAN FOR FORECASTABLE DISASTERS

Heatwave and drought are only forecastable hazards in the district. For such hazards following action plan is recommended:

Table 5: Action Plan for Heatwave Hazard Management

Action	Timelines	Responsibility
Interaction with PMD for forecasting and monitoring of heatwave	Based on forecast	PDMA
Dissemination of forecast to concerned DDMA and local community	Based on forecast	PDMA
Mobilization of NGOs, INGOs and individuals for arrangement of heat stroke and medical camps within affected areas	During disturbance period	PDMA and DDMA

Table 6: Action Plan for Drought Hazard Management

Action	Timelines	Responsibility
Interaction with PMD for forecasting and monitoring of drought	Based on forecast	PDMA
Dissemination of forecast to concerned DDMA and local community	Based on forecast	PDMA

Mobilization of NGOs, INGOs and individuals for stocking of food and life support items to prevent and mitigate famine conditions depending upon severity and spell of drought	During disturbance period	PDMA and DDMA

ACTION PLAN FOR UNFORECASTABLE HAZARDS

Earthquake

The earthquake is unforecastable hazard and does not provide reaction time to prevent damages. The recommended post disaster action plan are as follows

Table 7: Action Plan for Earthquake Hazard Management

Action	Timelines	Responsibility
Mobilization of man and material resources for rescue and recovery	Post disaster	PDMA and DDMA
Mobilization of NGO, INGO, volunteer groups, scouts and armed services for rescue and recovery	Post disaster	PDMA and DDMA
Coordination and establishment of relief camps, mobile medical camps, life support facilities and provision of relief to affectees	Post disaster	PDMA and DDMA
Coordination and mobilization of rescue teams to search and rescue life in collapsed structures	Post disaster	PDMA and DDMA
Coordination with National Disaster Management Authority (NDMA) for seeking assistance from international agencies (depending on severity of events	Post disaster	PDMA

and damages/losses)		
Coordination and mobilization of resources on Build Back Better principles	Post disaster	PDMA

SOP FOR PEOC AND DEOCs

- For the smooth operation of the emergency activities the PEOC and District Emergency Response Centre (DEOC) will work under defined Standard Operating Procedures (SOPs). These SOPs are broadly categorized in three sections

    a. Action on receipt of early warning, safe evacuation, search and rescue, initial assessment, relief distribution, recovery and deactivation of response.

    b. Coordination and information dissemination

    c. Contingency planning and response actions

- For localized emergencies, the situation shall be dealt within the regular operating mode of the emergency management services in the district.

- DDMA shall activate the DEOC and take the operational lead for the district government response.

- The DEOC will serve as the center for receiving early warning and issuing information to public at village level, taking measures to evacuate people, updating relevant departments, response agencies, and media etc.

- The DEOC will lead the coordination and management of relief operations in affected areas in the district with the assistance of PEOC.

- DEOC will coordinate with all concerned departments and humanitarian agencies at district level.

- DEOC will coordinate for early recovery with the assistance of PDMA and other concerned departments.

- In standby position, PEOC and DEOC shall be alert and ready to start emergency operations. The PEOC shall coordinate with concerned departments like NDMA, PMD, etc. for regular updates on likely disaster events. Once the threat is established, the PDMA shall approve the alert and activate response mechanism of PEOC and DEOC.

- Once PEOC and DEOC activation is approved or issued, both centers will remain fully operational on 24/7 basis and coordination shall be established with all concerned departments.

- PEOC and DEOC will collect regular updates on disaster situation and after normalization of situation and with mutual consultation shall inform PDMA to issue stand down or disaster deactivation call and final report on emergency operations will be circulated to stakeholders.

- The operationalization of PEOC and DEOC means complete activation of centers during disaster situation. Management of PDMA shall ensure full functionalities of PEOC including stock for emergency food, office supplies, communication system with backup support, electricity generators, computers, screens, multimedia projectors and other necessary equipment. While Deputy Commissioner Sanghar shall ensure availability of all necessary equipment and supplies at DEOC for 24/7 operations. The deputy commissioner or chairperson DDMA will also ensure availability and presence of representatives of DDMA in DEOC during emergency operations for liaison and close coordination and smooth emergency response.

- A contact information of relevant government officials, influential personnel, political figures, volunteer groups, social welfare organizations and communities of high disaster risk prone areas shall be collected and maintained by PEOC and DEOC. For establishing quick liaison and coordination this contact information shall be used by both PEOC and DEOC. In addition to these contacts, PEOC will arrange random SMS alerts, robo calls etc. through commercial cellular services.

- The PEOC will establish the direct contact/coordination with district disaster management officer for disaster alerts and warnings and onward dissemination and other immediate actions.

- All warnings and alerts shall be carefully scrutinized by the central body i.e. PDMA and disaster warning alerts shall only be issued through single nodal agency to avoid any circulation of misinformation etc.

- During the disaster, all instructions, guidelines, action plans and advisories on disaster events, evacuation, relief operations etc. shall be issued by PEOC or DEOC in consultation with PEOC.

DISASTER MANAGEMENT PLAN

INTRODUCTION

Following disaster management measures are recommended for effective preparation, response and rehabilitation of communities. PDMA may identify suitable partners/agencies to carry out each of the below-mentioned measures to maximize the effectiveness of disaster management plan and minimize losses in case of any disaster.

Riverine Flood	
UCs At Risk	Nil
General Description	According to MHVRA Study 2022, there is no risk of riverine flood in Sanghar district.

Earthquake	
UCs At Risk	All UCs
General Description	1. An earthquake is a sudden shaking of the ground caused by two chunks of eart1h's crust sliding past one another. 2. Although earthquakes are short-lived, usually not lasting more than a minute, they can leave behind incredible damage. 3. Identifying potential hazards ahead of time and advance planning can reduce the dangers of serious injury or loss of life from an earthquake. 4. The earthquake hazard intensity for district Sanghar is "**Low**" 5. The earthquake risk intensity for district Sanghar is "**Low**".
Disaster Management Measures	
Preparedness	
1. Identifying and inventorying weak buildings and structures especially in urban settings of the district and situation demanding action by concerned departments. 2. Preparation of landuse plans, town plans and implementation of building codes in new residential schemes, schools, public and private offices. 3. Implementation of disaster risk reduction measures in public infrastructure development schemes. 4. Establishment of search and rescue infrastructure and services which can be mobilized as first responder in post-earthquake situation. 5. Mobilize NGOs, INGOs, community development organizations and volunteers, and conduct earthquake safety awareness campaigns and drills especially in main urban settings. 6. Availability of necessary material and equipment required for establishing temporary shelters with life support facilities i.e. mobile medical camps, schools, power supply, water and sanitation etc.	

7. Availability of alternative communication system in case if usual communication means are disturbed by earthquake. 8. Preparation of medical emergency plan to manage mass casualties in face of any major earthquake event.
Response
1. Obtain firsthand information on intensity of earthquake and damages; prioritize areas for search and rescue operation. 2. Mobilize community-based volunteers, scouts and other trained personnel to hard hit areas to assess situation and help victims. 3. Establish emergency camps / shelters with necessary life support facilities. 4. Establish medical camps for provision of first aid and possible medical assistance to injured. 5. Evacuate people from damaged houses to safe places and shelters. 6. Provide security in affected areas and maintain law and order situation to prevent incidents of thefts and stampede. 7. Arrangement and conduct of aerial / drone survey of the affected areas. 8. Establish information and help desks for facilitation of affectees. 9. Restore essential services like power, water supply, and telecommunication of critical infrastructure like hospitals, control Rooms, etc. on priority basis.
Recovery and Rehabilitation
1. Detailed damage and need assessment for recovery and rehabilitation. 2. Rehabilitation on built back better principal.

Heatwave	
UCs At Risk	All UCs
General Description	1. Heatwave is a condition of atmospheric temperature that leads to physiological stress, which sometimes can claim human life. 2. Like most other districts of Sindh, Sanghar has an extreme climate – very cold in winters and very hot in summers. 3. The summer season commences from April and continues till October. May, June and July are the hottest months. The mean maximum and minimum temperature during this period is 44°C and 27°C respectively. 4. December, January and February are the coldest months. The mean maximum and minimum temperatures for these months are 26°C and 10°C, respectively. 5. A severe heatwave, in 2021, engulfed parts of Sindh, including

	Sanghar. 6. Higher daily peak temperatures of longer duration and more intense heatwaves are becoming increasingly frequent globally due to climate change. Sindh too is feeling the impact of climate change in terms of increased instances of heat wave with each passing year. 7. According to MHVRA Study 2022, heatwave hazard intensity for district Sanghar is "**Severe**" 8. According to MHVRA Study 2022, heatwave risk for district Sanghar is **"Low to High"**.
Disaster Management Measures	
Preparedness	
1. Consistent future development strategy: Tree plantation, restoration of natural ecosystem, construction of environment friendly and well planned residential societies, offices, infrastructure and human dwellings. 2. Monitoring for hot weather alerts through local and international sources and issuance of timely Hot Day Advisories, and Hot Day Warnings. 3. Upgradation of major public health care facilities with necessary equipment and medicines to treat heatstroke patients. 4. Heatstroke awareness campaigns and wide public coverage through media, social media, SMS, NGOs and social welfare organizations. 5. Arrangements for uninterrupted supply of electricity and water in vulnerable areas.	
Response	
1. Mobilization of NGOs, social welfare organization and volunteers for arranging heatstroke facilitation camps and distribution of fresh drinking water in affected areas. 2. Local radio FM broadcasts to disseminate heatstroke safety and precautions. 3. Mobilize mobile medical teams for first-aid and other medical emergency support in affected area. 4. Record keeping of heatwave patients and fatalities.	
Recovery and Rehabilitation	
1. Post event review of heatwave plan and modifications if required.	

Cyclone	
UCs At Risk	Nil
General Description	According to MHVRA Study 2022, there is no risk of Cyclone in Sanghar district.

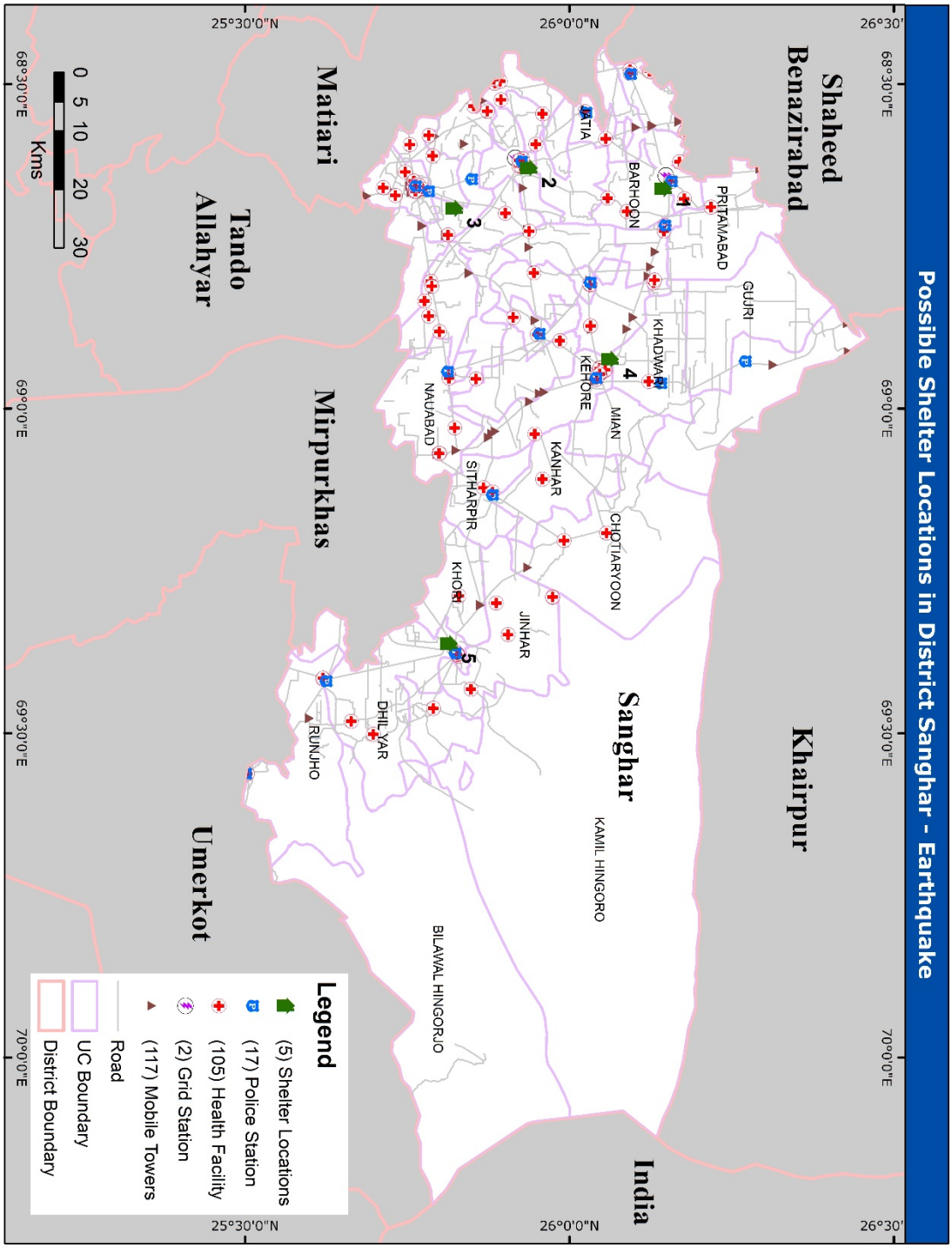
Drought	
UCs At Risk	All UCs
General Description	1. Climatic condition of the district can be categorized as Hot and Semi-Arid (Climate Classification of Pakistan (Khan et al., 2010) 2. 46.3% of the total district area is covered by bare areas with sparse natural vegetation. Eastern areas of district are covered with Achhro Thar (white desert). 3. Most of the water bodies are situated in central areas of the district, which demarcated western fertile land from eastern desert areas. 4. Most of the Range land with natural herbs are situated at north-west corner of the district. 5. Orchards are situated at west in proximity to built-up areas and water bodies. 6. Average annual rainfall received during a year across the district is 158.14 mm. 7. Agriculture mainly depends upon canal irrigation system and tube-wells. 8. According to MHVRA Study 2022, a. Meteorological drought hazard for district Sanghar is "**Extreme**" b. Meteorological drought risk for district Sanghar is "**Medium to Extreme**" c. Agricultural drought hazard for district Sanghar is "**Mild to Extreme**" d. Agricultural drought risk for district Sanghar is "**Low to Extreme**".
Disaster Management Measures	
Preparedness	
1. Implement Drought Early Warning System (EWS) at provincial/district level to get clear indications of the impending drought and its consequences, e.g. forecast of impending drought conditions related to changing weather conditions linked to El Nino or La Nina events. 2. Monitoring of temperature, precipitation, potential evapotranspiration, soil moisture, groundwater levels, and reservoirs. 3. Building of small-scale reservoir for rainwater harvesting 4. Implementation of water supply and demand management. 5. Control ground water extraction from upper and lower aquifers to be within the sustainable yield limits.	

Response
1. Assess data about the nature of drought conditions and their impact. 2. Provision and installation of solar water pumps for availability of clean drinking water. 3. Public information campaign for water management and saving.
Recovery and Rehabilitation
1. Awareness and encouragement of on best practices for water conservation.

Tsunami	
UCs At Risk	Nil
General Description	According to MHVRA Study 2022, there is no risk of Tsunami in Sanghar district.

SHELTER LOCATION MAP

As part of preparedness, response, and rehabilitation against hazards, shelter places are integral. These are necessary to relocate, evacuate, or replenish the population that may be affected from hazards. Proposed shelters are illustrated in the maps.



Annex-A details the list of earthquake shelter locations

PROPOSED PRIORITY DISASTER RISK MANAGEMENT PROJECTS

INTRODUCTION

Following are the recommended disaster risk management projects, which may be initiated to ensure effective disaster management in district Sanghar. PDMA may identify suitable partnering agencies / line departments to carry out and prioritize each proposed project.

Hazard wise list of Priority Disaster Risk Management Projects	
Disaster Risk Management Projects/ Studies	**Brief**
Earthquake	
1. Ensure implementation of building codes and standards.	Prepare policy and SOP to ensure new buildings in the district are constructed as per the seismic codes and standard of the area.
2. Identification and retrofitting of weak existing structures and unsafe buildings (schools, hospitals and government offices).	Coordinate with local community regarding unsafe buildings and regularly conduct building safety surveys to check structural integrity of buildings against the seismic risk of the district and take necessary retrofitting measures to strengthen weak structures. Create database of vulnerable and unsafe buildings and retrofitting measures taken to strengthen the structure of such buildings.
3. Preparation of rescue and rehabilitation plan	Coordinate with line departments to create a comprehensive plan with clearly defined roles and responsibilities of first responding departments, as well as, correspond with rescue agencies/NGOs for their role in an event of earthquake. The plan should also details the rescue equipment available with concerned departments.
Drought	
1. Conduct feasibility study for identification of suitable sites for rainwater harvesting and aquifer recharge in the district.	The rainwater harvesting sites should be identified by using geospatial technologies and ancillary data, which can be used as clean water aquifers by communities, which in turn can use it for drinking, and irrigation purposes. Potential rainwater harvesting sites may be identified by using Analytical Hierarchy Process (AHP) and spatial analyst tool, with multiple thematic layers (rain data, population, digital elevation model, soil type, etc.)

COST BENEFIT ANALYSIS

INTRODUCTION

1. Cost Benefit Analysis (CBA) is a key analytical tool that can provide quantitative information regarding the prioritization of risk reduction based on comparing benefits of an actual or planned intervention with its costs.

2. Cost Benefit Analysis (CBA) can play a pivotal role in advocacy and decision-making on disaster risk reduction (DRR) by demonstrating the financial and economic value of incorporating DRR initiatives into planning.

3. In an age of austerity, cost–benefit analysis continues to be an important tool for prioritizing efficient DRM measures but with a shifting emphasis from infrastructure-based options (hard resilience) to preparedness and systemic interventions (soft resilience), other tools such as cost-effectiveness analysis, multi-criteria analysis and robust decision-making approaches deserve more attention.

4. Studies categorize interventions into hard and soft type of measures. Hard resilience refers to the strengthening of structures and physical components of systems in order to brace against shocks imposed by extremes such as earthquakes, storms and floods. In contrast, soft resilience (Behavioural DDR) refers to less tangible and process-oriented measures as well as policy in order to robustly cope with events as they occur and minimize the adverse outcomes.

5. The studies find that many of the highest economic returns exist for behavioural DRR strategies

6. The benefits of hazard mitigation are the avoided losses, i.e., those losses that would have occurred in a probabilistic sense if the mitigation activity had not been implemented.

COST BENEFIT ANALYSIS – SANGHAR DISTRICT

The existing nature of disaster in Sanghar district can be categorized as low to extreme. The prominent hazard in the district is drought and to a certain extent, heatwave. The bigger threat here is posed by drought with risk ranging from low to extreme in the district. Low flow in irrigation channels and low rainfall are likely to adversely affect agricultural output in the event of drought. Settlements in the district are having low to high risk of heatwave. The district is far away from the coastline and is not susceptible to storm surge and tsunami. There is no risk of cyclone as well as riverine flood in the district. Sanghar district has low risk of earthquake. Based on the results of the MHVRA study the hazards of the district can be managed through soft and enhanced management measures. In this scenario, cost benefit analysis of proposed interventions is appended in table below:

Table8: Cost Benefit Analysis of Disaster Risk Measures in District Sanghar

S. no.	Soft resilience (Behavioral DRR)	Cost	Benefit
1.	Identification and management of shelters	Identification and management of shelter spaces is a cost-effective way to ensure rapid, and effective management of population at times of crisis. Government schools can serve as ideal cost-effective shelter spaces in district Sanghar, as these can accommodate large number of people. Gradually, permanent shelters can be established in future to avoid use of education facilities.	Shelter places are highly beneficial at times of disaster as it offers a unified accommodation place for affected people. Shelter place also helps administration in effective management of affectees and provide them with required relief. Shelter serve as centralized facilities where government can concentrate relief efforts including disbursement of relief goods and essential food supplies to affected people. Additionally, hydration stations at these shelters will improve accessibility to drinking water during times of heatwave. Reduction in cases of emergencies due to drought and heatwave can help in reducing burden on the health care facilities and reduce fatalities.
2.	Early warning system for drought	Dissemination of information by meteorological department regarding delays in rainfall season using radio announcements, print and digital media. Warnings to be issued prior to commencing maintenance on headworks and for low flow in channels.	Equipping farmers with knowledge of impending low flow in irrigation channels will enable for better crop water management and reduce loss of crops as much as possible. This shall lead to an overall reduction in cases of malnutrition, dehydration, save medical expenses and possible save lives.
3.	Early warning system for heatwave	Dissemination of forecast of heatwaves from the meteorological department through public radio announcements, print and digital media. This shall increase the preparedness of local populace against the impending hot climate and save precious lives. Early warning systems for periods of drought can help in minimizing the impact of disaster for concerned communities.	Early warnings give people time to prepare in advance and postpone activities after daytime. Local authorities would get ample time to establish relief centers with provisions of shade and hydration. Hospitals could be prepared to receive more patients and check their inventory for necessary medicine / supplements in advance. An overall reduction in emergency cases would reflect in less mortality and more savings in medical expenditure.
4.	Awareness campaigns	Public private partnership and use of electronic/print media for raising public awareness is a cost-	Public awareness and public education for disaster reduction helps to reduce disaster risks. It mobilizes people through clear messages,

		effective approach to build society resilience and improved disaster risk management capabilities of vulnerable communities.	supported with detailed information. People who know how to react in case of a disaster, community leaders who have learned to warn their people in time, and whole social layers who have been taught how to prepare themselves for natural hazards can contribute to better mitigation strategies and dissemination of information on the consequences of hazards. Education and knowledge can provide people with tools for vulnerability reduction and life-improving self-help strategies.
5.	Enhancement of municipal water system	Maintenance of existing distribution system shall help in reducing water losses and contamination.	Consumption of unclean water leads to many health problems including gastric issues, infections and other long term health issues. Ensuring adequate supply of clean water will reduce medical expenditure and prevent loss of life specially among the vulnerable groups like children and elderly.
6.	Strengthening of mobile health care facilities	Setup of temporary health facilities reduce difficulty in patients' transportation to permanent hospital facilities. Mobile health care units are already available with government of Sindh, their mobilization to disaster management will ensure lifesaving.	Mobile health facilities play a very significant role in the mitigation of disaster because of their particular function in providing essential first aid. Ease of access to basic health facilities will reduce burden on hospitals. The systematic organization and easy mobilization of the staff, equipment and medical supplies in a safe environment are crucial if disaster response is to be prompt and effective.

ANNEX – A – SHELTER LOCATIONS DESCRIPTION – EARTHQUAKE

The given shelter locations for earthquake are proposed on the findings of the MHVRA 2022 study and information obtained through satellite technology and online verifiable sources. It is recommended to conduct on ground physical surveys to evaluate their suitability.

Shelter location	Co-ordinates			Area (acres)	Estimated Tents (numbers)	Avg. elevation (ft)
1	Upper right corner:	26° 8'45.44"N	68°40'5.83"E	205	~9,200	83
	Upper left corner:	26° 8'58.19"N	68°39'29.62"E			
	Lower right corner:	26° 8'22.08"N	68°39'52.50"E			
	Lower left corner:	26° 8'44.42"N	68°39'13.53"E			
2	Upper right corner:	25°56'28.40"N	68°37'58.09"E	53.2	~2,300	85
	Upper left corner:	25°56'19.78"N	68°37'37.67"E			
	Lower right corner:	25°56'0.45"N	68°37'50.18"E			
	Lower left corner:	25°55'59.32"N	68°37'46.65"E			
3	Upper right corner:	25°49'47.70"N	68°41'54.01"E	870	~39,000	79
	Upper left corner:	25°49'45.83"N	68°41'4.89"E			
	Lower right corner:	25°48'53.53"N	68°42'21.75"E			
	Lower left corner:	25°48'53.00"N	68°40'37.61"E			
4	Upper right corner:	26° 4'11.12"N	68°55'22.13"E	292	~13,000	67
	Upper left corner:	26° 3'34.42"N	68°54'59.46"E			
	Lower right corner:	26° 3'40.33"N	68°56'1.57"E			
	Lower left corner:	26° 3'27.01"N	68°55'5.62"E			
5	Upper right corner:	25°48'43.72"N	69°22'6.77"E	110	~4,900	50
	Upper left corner:	25°49'6.02"N	69°21'27.94"E			
	Lower right corner:	25°48'37.44"N	69°22'1.28"E			
	Lower left corner:	25°48'58.09"N	69°21'18.05"E			

A total of 5 shelter locations have been selected as Earthquake shelter places across the district. The shelter locations are selected based on their proximity to the population vulnerable to earthquake, and accessibility to roads and other basic facilities (healthcare, education, police station, etc.) A total of 68,400 tents approximately (tent with size of 45 sq. m each) can be set up within the demarcated shelter places.

ANNEX – B – LIST OF EQUIPMENT AVAILABLE IN DISTRICT SANGHAR

Equipment	Quantity
De-watering Machine	114
Fire Brigade / Engine / Tender	9
Tractor / Trolley / Blade	25
Water Boozer	1
Refuge Van	5
Fumigation Machine	2
Power Generators	2
Mono Block	6

Source: *Provincial Monsoon contingency plan 2020 – PDMA, Government of Sindh*